

ENVIRONMENTAL SCREENING WORKSHEET INFORMATION

Project Name: Arrowhead to Weston Transmission Project

I. Engineering Information

A. Type of line construction required and the location of each type

Arrowhead to Weston –The line may be either single circuit or double circuit depending on the route and location.

Tripoli to Rhinelander - The line may be either single circuit or double circuit depending on the location.

B. Line data

The project consists of two parts. The major part is a 345-kV line connecting the Arrowhead Substation near Duluth, Minnesota to the Weston Substation near Wausau, Wisconsin. The second part is a 115-kV line from the proposed Tripoli Substation to Rhinelander, Wisconsin.

1. Voltage

Arrowhead to Weston - 345-kV
Tripoli to Rhinelander - 115-kV

2. Conductor size

Arrowhead to South Range/Hines – 1272 kcmil ACSR, two-conductor bundle
South Range/Hines to Weston – 954 kcmil ACSR, two-conductor bundle
Tripoli to Rhinelander – 795 kcmil ACSR

3. Span length (typical)

Arrowhead to Weston – 800 to 1,000 feet
Tripoli to Rhinelander – 600 to 800 feet

4. Structure height above ground (typical)

Arrowhead to Weston –H-frame structures would be 85 to 95 feet tall.
Single-pole structures would be 90 to 105 feet tall.
Double circuit structures would be 125 to 135 feet tall.

Tripoli to Rhinelander – Single circuit structures would be 70 to 100 feet tall. Double circuit structures would be 85 to 110 feet tall.

5. Structure type

Arrowhead to Weston - Tangent structures may be either weathering steel H-frame structures or weathering steel tubular single-pole structures. Angle structures would vary depending on the circumstances. Angles may be single-pole structures, three-pole structures or lattice structures.

Tripoli to Rhinelander - All structures would be weathering steel single poles.

6. Structure material

Arrowhead to Weston – H-frame and single pole structures would be weathering steel. Lattice structures would be galvanized steel or aluminum. Tripoli to Rhinelander – Tubular steel poles would be weathering steel.

7. Structure drawings

Arrowhead to Weston –Figures A1-1 to A1-6 show the possible structure types.

Tripoli to Rhinelander –Figures A1-7 and A1-8 show the possible structure types.

Figure A2-1 defines the right-of-way requirements for different construction situations.

8. Construction Procedures for Transmission Lines

Construction of the 345-kV transmission line would begin with centerline survey and staking of right-of-way limits. Clearing of the right-of-way would follow this task. Clearing operations would generally remove trees and brush to a height of approximately 6 inches above ground line. Minimal amounts of grading operations would be required to provide a narrow construction road allowing unobstructed passage of line construction equipment.

Tracked and rubber-tired equipment including dozers, loaders, excavators, backhoes, line trucks, cranes, bombardiers, digger derricks, compressors, wire stringing equipment, pole trailers, concrete trucks, small personal all terrain vehicles, pickups, and other equipment would be utilized in line construction.

Direct-embedded structures would be set after augering the appropriate size hole in the soil. Drilled pier reinforced-concrete foundations would be required for single-pole structures, angle structures and deadend structures.

Concrete is normally delivered to the foundation location in typical ready-mix trucks. Foundations in wetland areas would be targeted for winter construction. Where access is difficult, other means of transport including smaller, more mobile drop buckets may be utilized.

Insulators and suspension hardware, along with temporary stringing blocks and pulling rope, would then be hung from the structures. Conductor, shield wire, and optical ground wire (OPGW) would be pulled in, tightened to the correct tension, terminated, and clipped into the permanent suspension hardware. The stringing blocks would then be removed.

Access to the structure locations would normally be in a linear path down the established right-of-way from public property such as road crossings. When progress down the right-of-way is obstructed by natural barriers such as impassable wetlands, rivers, streams, or difficult terrain; manmade barriers such as freeways, railroads, or pipelines; or the distance between access points hinders construction, permanent off right-of-way easements would be acquired from adjacent landowners. Permanent off right-of-way easements would be required for construction and future maintenance, but would not preclude additional temporary access points during construction. Severe restrictions placed on river, stream or wetland crossings may result in inaccessible structure locations making a particular route impractical to construct. This situation has not been identified on the routes presently under consideration.

Construction in wetlands presents conditions that are more challenging. Winter construction efforts would focus on these areas to take advantage of frozen soil conditions. Support mats may be utilized where soil conditions would not support construction equipment. Under extreme access limitations, helicopters may be utilized for the setting of structures. Other ground-based equipment would be required for augering holes and installing foundations, if required.

Crossings of small rivers and streams are possible provided the water depth is not excessive, approaching banks are not exceedingly steep and soil conditions will support the weight of the construction equipment. Certain environmental considerations may preclude crossing of some rivers and streams. Alternate access points would then be sought.

Restoration of the right-of-way would normally include back-blading of disturbed soils and reseeding.

C. Substation facilities needed at new sites and additions at existing sites

The project would include the modification of the Weston 345-kV Substation at the Weston Power Plant, the modification of the Highway 8 115-kV Substation in Rhinelander, and the construction of a new 345/115-kV substation near Tripoli. Four possible sites have been identified for the Tripoli Substation. Modifications to the Arrowhead Substation near Duluth, Minnesota are not covered in this application.

D. Project Cost by Route

See Appendix B in Volume II.

II. Route Information

A. Maps showing location of line routes and/or size and location of substation site or expansion.

Figure A3-1 provides an overview of the study area. The individual segments are shown in Figures A4-1 to A4-20.

1. Topographic maps 1:24,000 scale

U.S.G.S. 7.5-minute topographic maps were submitted to the PSCW under separate cover.

2. Plat maps

County plat maps were submitted to the PSCW under separate cover.

3. City street maps

Selected street maps were submitted to the PSCW under separate cover.

4. Aerial photographs

Aerial photos were submitted to the PSCW under separate cover.

5. Zoning and land use maps

Zoning and land use maps were submitted to the PSCW under separate cover. Figure A5-1 is a listing of the zoning jurisdictions crossed by possible segments. Figures A6-1 and A6-2 are listings of the county forest land use

plans, farmland preservation plans, and county recreation plans available by county.

6. Flood plain maps (flood insurance rate maps)

Flood Plain maps were submitted to the PSCW under separate cover.

B. Approximate route descriptions

Due to the size of the project, and the nature of the routes, the project was divided into four sectors for analysis. The sectors are numbered 1 to 4. The routes within each sector are numbered with a decimal, e.g. 1.1, 1.2, 1.3. The segments within each sector are numbered similarly to the sector. Segments numbered 1 to 161 are located in sector 1. Segments numbered 201 to 243 are located in sector 2. Segments numbered 302 to 399 are located in sector 3. Segments numbered 401 to 490 are located in sector 4. Figures A7-1 to A7-5 contain a list of the segments in each route.

Sector 1 covers the area from the Weston Substation north to the Tripoli substation area and west to Exeland. The counties in this sector are: Marathon, Lincoln, Price, Taylor, Rusk, and Sawyer. The routes in this sector are 1.1, 1.2, and 1.3.

Sector 2 covers the area from the Weston Substation west to Owen-Withee and north to Exeland. There is no intermediate substation site along these routes. The counties included in this sector are Marathon, Clark, Chippewa, Rusk, and Taylor. The route alternatives are 2.1 and 2.2.

Sector 3 covers the area from Exeland to Oliver. The counties in sector 3 are Washburn, Sawyer, and Douglas. The route alternatives are 3.1 and 3.2.

Sector 4 covers the area from the proposed Tripoli substation to the Highway 8 Substation in Rhinelander. The counties in this sector include Price, Lincoln, and Oneida.

1. Segment Descriptions for Route 1.1 Weston to Exeland via Tripoli

Segment 1ax would originate at the Weston Substation and extend west along an existing WPS transmission line, approximately 1.7 miles, crossing the Wisconsin River. It would continue south approximately 2,300 feet, ending at the intersection with segments 1bx and 48. The segment would primarily cross a mixture of forests and wetlands with a small area of residential land present. The existing line would be rebuilt as a double-circuit line within the existing right-of-way.

Segment 1bx extends southwest, double-circuiting the existing 345-kV transmission line for approximately 1 mile. It ends at the intersection with segment 7a north of Spring Brook Road. This segment would primarily cross county forestland.

Segment 7a extends west approximately 1,200 feet along the Williams pipeline. It would continue west approximately 3,000 feet along the north side of Spring Brook Road. The segment ends at the intersection with segments 49 and 7b. The area consists primarily of pine plantation. Additional right-of-way would be required along the road and the pipeline.

Segment 49 extends northwest approximately 1 mile. It ends at the intersection with segments 48 and 14b. The area traversed is primarily forested.

Segment 14b extends west across Hollywood Road, then turns north for approximately 2 miles. From that point, the segment would turn west for approximately 6 miles across State Highway 107 and County Highway S. The segment continues west over a mile to its end at the intersection with segments 17, 19 and 20. The segment crosses intermittent forest and agricultural land.

Segment 20 extends north approximately 6,700 feet and crosses County Highway N. The segment would continue north approximately 14,400 feet. It would then turn northwest, crossing State Highway 29 and County Highway U. The segment would then continue north approximately 10,600 feet crossing the Big Rib River. The segment ends at the intersection with segments 25 and 26. The land crossed is primarily agricultural.

Segment 25 extends north-northeast for approximately 1 mile, and crosses County Highway A. The segment would then angle northwest for approximately 1 mile, crossing Lincoln Drive and Washington Drive. It would continue northwest approximately 3 miles across County Highway S and County Highway F, ending at the intersection with segments 26 and 27. The area traversed is composed of intermittent agricultural and forested land.

Segment 27 extends northwest approximately 2.3 miles and ends at segment 31, south of County Line Road. The segment crosses primarily forested land.

Segment 31 extends northwest approximately 2.75 miles, and crosses State Highway 64. It would continue northwest approximately 2,700 feet. The segment ends at the intersection with segments 28 and 34. The land it would traverse is forested.

Segment 34 extends north approximately 23 miles. The segment weaves around some wetlands as it runs roughly parallel to and east of the Lincoln County line. The segment runs parallel to Tower Road for approximately 3 miles. The segment also crosses Highway 86 before ending south of Squaw Creek near substation site 1. The area is primarily forested.

Segment 38w,x extends north for approximately 1,400 feet crossing Squaw Creek Road. It would continue north approximately 2,300 feet. The line could be either a single 345-kV or a 345/115-kV double-circuit, depending on the selected route from Tripoli to Rhinelander. The segment ends at substation site 2. The area consists of intermittent forest and agricultural land.

Segment 107a,w spans the 1,100 feet from segment 38 to the Lincoln/Price County line, also known as Squaw Creek Road. The substation may be located in this space, however, the exact location has not been defined at this time. Substation descriptions are provided in Section III. G of this screening worksheet.

Segment 107b,w continues west-northwest into Price County for approximately 4 miles and crosses Squaw Creek. The segment crosses County Highway D before ending at West Knox Road. These segments would be built as 345-kV if substation sites 1 or 2 are built; or as 115-kV if substation sites 8 or 9 are built. The area primarily consists of forest land.

Segment 109 extends west approximately 1,100 feet from West Knox Road to segment 47. It passes through substation site 9. The area is forested.

Segment 111 extends west approximately 3 miles, crossing Pikes Peak Road and Douglas Creek. The segment ends at the intersection with segments 117 and 119. The area crossed consists of forests with some intermittent agricultural and wetland areas.

Segment 119 extends west approximately 4 miles. The segment crosses Douglas Creek and County Highway C. It angles northwest for approximately one mile after crossing County Highway C. The segment ends at the intersection with segments 121 and 123. The area consists of primarily forested land.

Segment 123 extends west approximately 3 miles, crossing Douglas Creek, Prentice Road and State Highway 13. It ends at an existing NSP transmission line. The area consists of intermittent agricultural and forested land.

Segment 127# extends north, double-circuiting the existing NSP 69-kV line, for approximately 1,700 feet. It crosses the South Fork Jump River. The segment would continue north, on new right-of-way, for approximately 1 mile. It ends at the intersection with an existing NSP 115-kV transmission line. The area is primarily forested.

Segment 129x extends north approximately 2 miles, crossing the Wisconsin Central railroad and Highway 8, ending at segment 131x. The area is primarily forested.

Segment 131x extends west approximately 9 miles. The segment ends approximately one mile west of Highway 111, north of Catawba. The existing NSP 115-kV line would be relocated and double-circuited with this line. The segment crosses through forestland.

Segment 135x continues west for approximately 16 miles, ending at the intersection with segments 140 and 141. The existing NSP 115-kV line would be relocated and double-circuited with this line. Most of the land crossed would be forested with intermittent agricultural land.

Segment 140x extends southwest approximately one mile from segment 135x to 153ax. The existing NSP 115-kV line would be relocated and double-circuited with this line. The segment crosses predominantly forested land.

Segment 153ax would involve double-circuiting the existing NSP 115-kV line for approximately 2 miles. The segment crosses Deer Tail Creek. It ends at the intersection with segment 157. The area is a mixture of forest and agriculture.

Segment 153bx would continue along the existing NSP 115-kV line for approximately 6,300 feet. It crosses County Highway X, ending at the intersection with another 115-kV line that runs north. The area is predominantly forested.

Segment 144# would begin by following the existing NSP 115-kV line west for approximately 1.3 miles. When the existing transmission line turns northwest into the Osprey Substation, the segment would continue west across the Flambeau River. The segment would then turn northwest, ending north of County Highway I. A majority of the area is forested. The existing line would be rebuilt as double-circuit.

Segment 145a extends west to the north of County Highway I for approximately 6 miles. The area consists of intermittent forests and agricultural land.

Segment 145b angles northwest, then turns westerly and crosses the Thornapple River. It extends approximately 6 miles, crossing State Highway 27 and County Highway J and ends west of the Little Thornapple River. The area traversed is mostly forested.

Segment 149b crosses Bear Creek, heading northwest approximately 1.75 miles. It crosses County Highway J. It ends at the western side of the Wisconsin Central railroad and the intersection with segments 152 and 302'. The segment crosses predominantly forested land.

Segment 302' extends west from the Wisconsin Central railroad to the Lakehead pipeline right-of-way for a distance of approximately 1.4 miles. The area is forested along the eastern half and agricultural along the western half of the segment.

Segment 301b turns northwest along the Lakehead pipeline right-of-way to the Chippewa River for 0.5 miles across mostly forested land.

Segment 303 extends northwest approximately 1.3 miles crossing the Chippewa River and then State Highway 40. The segment crosses agricultural fields and some woodland.

Segment 308' extends northwest approximately 2.7 miles. It crosses Big Weirgor Creek and ends at the intersection with a 69-kV transmission line. The area is primarily forested. This point is the end of Route 1.1 for the 345-kV line.

Route 1.1 also includes two 115-kV segments, described below.

Segment 159v extends south from segment 135x along the west side of Woodlawn Road for approximately 3,400 feet. It ends at the Catawba Substation located near the intersection of Woodlawn Road and Oak Ridge Ave. This segment would serve only as a 115-kV connection to the substation in order to maintain that service. The area is agricultural.

Segment 161v would extend south from segment 135x for approximately 4,000 feet along the east side of County Highway M to the existing 115-kV line which connects to the existing Hawkins Substation located near the intersection of segments 156x and Highway M. The area is primarily agricultural. Again, this segment would be 115-kV only.

2. Segment Descriptions for Route 1.2 Weston to Exeland via Tripoli

Segment 1ax would originate at the Weston Substation and extend west along an existing WPS transmission line, approximately 1.7 miles, crossing the Wisconsin River. It would continue south approximately 2,300 feet, ending at the intersection with segments 1bx and 48. The segment would primarily cross a mixture of forests and wetlands with a small area of residential land present. The existing line would be rebuilt as a double-circuit line within the existing right-of-way.

Segment 1bx extends southwest, double-circuiting the existing 345-kV transmission line for approximately 4,600 feet. It ends at the intersection with segment 7a north of Spring Brook Road. This segment would primarily cross county forest land.

Segment 8ax extends southwest approximately 3,000 feet along the existing WPS 345-kV transmission line. The segment crosses County Highway KK. It ends at segment 8b#. The area is primarily residential and forest.

Segment 8b extends southwest approximately 2,000 feet, branching off from the existing right-of-way. It ends at the intersection with segments 11 and 12. The area is primarily within the County forest.

Segment 11 extends west for approximately 8.5 miles. It crosses Highways B, O, 107 and S. It ends at the intersection with segments 16 and 201 approximately one half-mile west of County Highway S. The segment would primarily cross agricultural land. All new right-of-way would be required.

Segment 16 extends north approximately 1.7 miles. It crosses County Highway P and continue north approximately 3,500 feet. It would angle northwest and continue approximately 1 mile to the intersection with segments 17 and 18. The segment crosses primarily agricultural land.

Segment 18 extends northwest approximately 1,500 feet between segments 16 and 21. The segment would primarily cross agricultural land.

Segment 21 extends west approximately 2.4 miles. It crosses County Highway H and continues approximately 3,500 feet. It ends at segment 23a. The segment crosses a mixture of forested and agricultural land.

Segment 23a extends northwest approximately 1.5 miles. It crosses County Highway N and continues northwest approximately 1.7 miles to its end. The segment crosses intermittent agricultural and forested areas.

Segment 23b would angle northwesterly, extending approximately 4,700 feet. It turns west and continues for approximately 2,500 feet, crossing County Highway M. The segment ends at the intersection with segment 24b'south of State Highway 29. It crosses forested and agricultural land.

Segment 24b' extends north from State Highway 29 for approximately 10 miles, roughly parallel to County Highway M. The segment crosses Black Creek east of Athens. The segment ends northeast of Athens and north of County Highway F. The land crossed is primarily agricultural.

Segment 29 is over 34 miles long. It initially runs west for approximately 3 miles, crossing Highway 97. It would continue west approximately 2 miles and makes a ninety-degree turn to the north. The segment then runs generally north the rest of its length. This segment crosses Highway 64 and the Big Rib River. The segment makes an eastward bow in the vicinity of Spirit Lake before passing from Taylor County into Price County. This segment also crosses Highway 102 and Highway 86 before ending near substation site 8. The southern part of the segment is primarily agricultural, while the northern part is primarily forested.

Segment 110x extends east approximately 1,300 feet from the end of segment 29 across West Knox Road, to substation site 8. The area along the segment is entirely forested.

For the purposes of this analysis the site of substation site 8 is assumed to be on the east side of West Knox Road. The exact site has not been defined at this time. Substation descriptions are provided in Section III. G. of this screening worksheet.

Segment 112 extends west approximately 2.5 miles, crossing Pikes Peak Road. It ends at segment 118. The segment crosses through a forested area.

Segment 118 extends west approximately 4 miles, crossing Goetze Road and County Highway C. The segment ends at the intersection with segments 121 and 122. The area is predominantly forested.

Segment 122 extends west approximately 3.5 miles, crossing the Wisconsin Central railroad and then State Highway 13. The segment ends at the existing

NSP 69-kV transmission line. The area is mostly forested with a few agricultural fields.

Segment 126'x extends west approximately 25 miles. The segment runs south of Catawba and Kennan, then jogs north of Hawkins. It crosses both the South Fork Jump River and the North Fork Jump River. The west end of the segment runs north of Wilson Road. The segment ends north of Ingram, at the intersection with segments 136x and 137x. The existing NSP 115-kV transmission line would be relocated to 126'x and double-circuited with the 345-kV line. The area consists of intermittent forest and agricultural land

Segment 136x extends northwest approximately 3,100 feet ending at segment 139ax. The existing NSP 115-kV transmission line would be relocated and double-circuited with the 345-kV line. The land traversed would be a mixture of forested and agricultural land.

Segment 139ax extends northwest approximately 3,000 feet. It crosses North Fork Main Creek, ending at the intersection with segments 156x and 139bx. The existing NSP 115-kV transmission line would be relocated to 139ax and rebuilt as double-circuit with the 345-kV line. The area traversed consists of forested land.

Segment 139bx extends west, double-circuiting the existing NSP 115-kV transmission line, for approximately one mile. The segment ends at the intersection with segments 140, 153ax, and 154. Forest covers a majority of the segment.

Segment 154 extends northwest approximately 4,900 feet. It would intersect with segments 141 and 155a at its endpoint. The segment extends through predominantly forested land.

Segment 155a extends northwest approximately 3,100 feet, crossing County Highway K. It would continue northwest approximately 8,100 feet, crossing Feld Road. The segment ends at the intersection with segments 157 and 155b. The area would predominantly consist of forested land.

Segment 155b extends northwest approximately 4,400 feet. The segment then turns west and crosses the Flambeau River. The segment would continue west for approximately 4 miles, crossing Crooked Creek. It ends at segment 147. The land crossed would be predominantly forested.

Segment 147 extends northwest for approximately 11.5 miles towards Exeland. It crosses the Little Thornapple River, State Highway 27, the Chippewa River,

and State Highway 40. The segment ends just east of the Wisconsin Central railroad southeast of Exeland. The land crossed is predominantly forested.

Segment 309 extends northwest approximately 1,000 feet from the Wisconsin Central railroad to an existing 69-kV transmission line. The segment passes south of Exeland through a mixture of forest and agriculture. This segment completes the 345-kV portion of Route 1.2.

To maintain the integrity of the 115-kV system involved, however, this route includes four segments that are 115-kV only.

Segment 125x extends north, following the existing NSP 69-kV transmission line, for approximately 1 mile. The segment ends at the intersection with segments 127#, and 123. The area is mostly forested. This segment would be rebuilt as a 69/115-kV double circuit line in order to maintain the integrity of the existing NSP line.

Segment 127v# extends north, double-circuiting the existing NSP 69-kV line, for approximately 1,700 feet. The segment would then continue north, as a single-circuit line, on new right-of-way for approximately 1 mile. It ends at the intersection with an existing NSP 115-kV transmission line. The area is primarily forested.

Segment 158v extends north along the west side of Woodlawn Road for approximately 1 mile. It crosses to the east side of the road and continues north approximately 3,500 feet, crossing Highway 8. It would continue north approximately one more mile. The segment ends at the Catawba Substation located near the intersection of Woodlawn Road and Oak Ridge Ave. The area is comprised of a mixture of agricultural and forest land. This segment would serve only as a 115-kV connection to the substation in the case that the existing 115-kV line on segment 156x is relocated along segment 126'x. The segment would not be used for the 345-kV line.

Segment 160v extends north from segment 126'x for approximately 2 miles along the east side of County Highway M. The segment ends at the Hawkins Substation located near the existing line along segment 156x. This segment would serve as a 115-kV connection to the substation in the case that the existing 115-kV line on segment 156x is relocated along segment 126'x. The area is primarily agricultural with some forests present.

3. Segment Descriptions for Route 1.3 Weston to Exeland via Tripoli

Segment 1ax would originate at the Weston Substation and extend west along an existing WPS transmission line, approximately 1.7 miles, crossing the Wisconsin River. It would continue south approximately 2,300 feet, ending at the intersection with segments 1bx and 48. The segment would primarily cross a mixture of forests and wetlands with a small area of residential land present. The existing line would be rebuilt as a double-circuit line within the existing right-of-way.

Segment 48 extends west approximately 2 miles. It crosses county forest land and Fourmile Creek, ending at the intersection with segments 49, 14a and 14b. The area is primarily forested.

Segment 14b extends west across Hollywood Road, then turns north for approximately 2 miles. From that point, the segment would turn west for approximately 6 miles crossing State Highway 107 and County Highway S. The segment continues west over a mile to its end at the intersection with segments 17, 19 and 20. The segment crosses intermittent forest and agricultural land.

Segment 19 extends west approximately 900 feet. It ends at the intersection with segments 18 and 21. The segment crosses a mixture of forested and agricultural land.

Segment 21 extends west approximately 2.4 miles. It crosses County Highway H and continues approximately 3,500 feet. It ends at segment 23a. The segment crosses a mixture of forested and agricultural land.

Segment 23a extends northwest approximately 1.5 miles. It crosses County Highway N and continues northwest approximately 1.7 miles to its end. The segment crosses intermittent agricultural and forested areas.

Segment 23b would angle northwesterly, extending approximately 4,700 feet. It turns west and continues for approximately 2,500 feet, crossing County Highway M. The segment ends at the intersection with segment 24b' south of State Highway 29. It crosses forested and agricultural land.

Segment 24b' extends north from State Highway 29 for approximately 10 miles, roughly parallel to County Highway M. The segment crosses Black Creek east of Athens. The segment ends northeast of Athens, and north of County Highway F. The land crossed is primarily agricultural.

Segment 29 is over 34 miles long. It initially runs west for approximately 3 miles, crossing State Highway 97. It would continue west approximately 2 miles and make a ninety-degree turn to the north. The segment then runs generally north the rest of its length. This segment crosses State Highway 64 and the Big Rib River. The segment makes an eastward bow in the vicinity of Spirit Lake before passing from Taylor County into Price County. This segment also crosses State Highways 102 and 86 before ending near substation site 8. The southern part of the segment is primarily agricultural, while the northern part is primarily forested.

Segment 110x extends east approximately 1,300 feet from the end of segment 29 across West Knox Road, to substation site 8. The area along the segment is entirely forested.

For the purposes of this analysis, the site of substation site 8 is assumed to be on the east side of West Knox Road. The exact site has not been defined at this time. Substation descriptions are provided in Section III. G. of this worksheet.

Segment 112 extends west approximately 2.5 miles, crossing Pikes Peak Road. It ends at segment 118. The segment crosses through a forested area.

Segment 118 extends west approximately 4 miles, crossing Goetze Road and County Highway C. The segment ends at the intersection with segments 121 and 122. The area is predominantly forested.

Segment 122 extends west approximately 3.5 miles, crossing the Wisconsin Central railroad and then State Highway 13. The segment ends at the existing NSP 69-kV transmission line. The area is mostly forested with a few agricultural fields.

Segment 125x extends north, following the existing NSP 69-kV transmission line, for approximately 1 mile. The segment ends at the intersection with segments 127# and 123. The area is mostly forested. The segment would be rebuilt as a double-circuit line in order to maintain the integrity of the existing NSP line.

Segment 127# extends north, double-circuiting the existing NSP 69-kV line, for approximately 1,700 feet. It crosses the South Fork Jump River. The segment would continue north, on new right-of-way, for approximately 1 mile. It ends at the intersection with an existing NSP 115-kV transmission line. The area is primarily forested.

Segment 130x would be built as a double-circuit rebuild of the existing NSP 115-kV transmission line, which runs west to Big Falls Dam. The segment runs northwest across U.S. Highway 8 then turns west along Pennington Road for a total length of approximately 10 miles. West of State Highway 111 the segment passes north of Catawba, where it ends at segment 156x, on the east side of Worsech Road. The area is primarily forest with some intermittent agricultural and wetland areas.

Segment 156x extends west, along the existing NSP 115-kV line north of Oak Ridge Avenue. It would continue for approximately 15 miles. The segment crosses the Middle Fork Main Creek. This segment would be constructed as a double-circuit line with the 115-kV line. The segment ends at the intersection with segments 139a and 139bx. The area consists primarily of forest with some agricultural land present.

Segment 139bx extends west, double-circuiting the existing NSP 115-kV transmission line, for approximately 1 mile. The segment ends at the intersection with segments 140, 153ax, and 154. Forest adjoins a majority of the segment.

Segment 153ax would involve double-circuiting the existing NSP 115-kV line for approximately 2 miles. The segment crosses Deer Tail Creek. It ends at the intersection with segment 157. The area is a mixture of forest and agriculture.

Segment 153bx would continue along the existing NSP 115-kV line for approximately 6,300 feet. It crosses County Highway X, ending at the intersection with another 115-kV line that runs north. The area is predominantly forested.

Segment 144# would begin by following the existing NSP 115-kV line west for approximately 1.3 miles. When the existing transmission line turns northwest into the Osprey Substation, the segment would continue west across the Flambeau River. The segment would then turn northwest, ending north of County Highway I. A majority of the area is forested. The length along the existing line would be rebuilt as double-circuit.

Segment 145a extends west to the north of County Highway I for approximately 6 miles. The area consists of intermittent forests and agricultural land.

Segment 145b angles northwest, then turns westerly and crosses the Thornapple River. It extends approximately 6 miles, crossing State Highway

27 and County Highway J and ends west of the Little Thornapple River. The area traversed is mostly forested.

Segment 149b crosses Bear Creek, heading northwest approximately 1.75 miles crossing County Highway J. It ends at the western side of the Wisconsin Central railroad and the intersection with segments 152 and 302'. The segment crosses predominantly forested land.

Segment 152 extends northwest along the Wisconsin Central railroad right-of-way. It extends approximately 2,700 feet. The segment ends at segment 305. The area is a mixture of forest and open land.

Segment 305 follows the Wisconsin Central railroad right-of-way to the north for approximately 1 mile. It crosses the Chippewa River next to the railroad bridge. The area is primarily forested.

Segment 307 continues northwest along the Wisconsin Central railroad right-of-way for approximately 4 miles. The segment crosses State Highway 40. The segment turns north, away from the railroad, for approximately 2,500 feet as it crosses into Sawyer County, then angles back to the railroad after it crosses Little Weirgor Creek. The area traversed is primarily forested.

Segment 309 extends northwest approximately 1,000 feet from the Wisconsin Central railroad to an existing 69-kV transmission line. The segment passes south of Exeland through a mixture of forest and agriculture. This segment marks the end of this route.

4. Segment Descriptions for Route 2.1 Weston to Exeland via Owen-Withee

Segment 1ax would originate at the Weston Substation and extend west along an existing WPS transmission line, approximately 1.7 miles, crossing the Wisconsin River. It would continue south approximately 2,300 feet, ending at the intersection with segments 1bx and 48. The segment would primarily cross a mixture of forests and wetlands with a small area of residential land present. The existing line would be rebuilt as a double-circuit line within the existing right-of-way.

Segment 1bx extends southwest, double-circuiting the existing 345-kV transmission line for approximately 1 mile. It ends at the intersection with segment 7a north of Spring Brook Road. This segment would primarily cross county forest land.

Segment 7a extends west approximately 1,200 feet along the Williams Pipeline. It would continue west approximately 3,000 feet along the north side of Spring Brook Road. The segment ends at the intersection with segments 49 and 7b. The area primarily consists of pine plantation. Additional right-of-way would be required along the road and the pipeline.

Segment 49 extends northwest approximately 1 mile. It ends at the intersection with segments 48 and 14b. The area traversed is primarily forested.

Segment 14b extends west across Hollywood Road, then turns north for approximately 2 miles. From that point, the segment would turn west for approximately 6 miles across State Highway 107 and County Highway S. The segment continues west over a mile to its end at the intersection with segments 17, 19 and 20. The segment crosses intermittent forest and agricultural land.

Segment 19 extends west approximately 900 feet. It ends at the intersection with segments 18 and 21. The segment crosses a mixture of forested and agricultural land.

Segment 21 extends west approximately 2.4 miles. It crosses County Highway H and continues approximately 3,500 feet. It ends at segment 23a. The segment crosses a mixture of forested and agricultural land.

Segment 23a extends northwest approximately 1.5 miles. It crosses County Highway N and continues northwest approximately 1.7 miles to its end. The segment crosses intermittent agricultural and forested areas.

Segment 23b would angle northwesterly, extending approximately 4,700 feet. It turns west and continues for approximately 2,500 feet, crossing County Highway M. The segment ends at the intersection with segment 24b'south of State Highway 29. It crosses forested and agricultural land.

Segment 202ax,y,z* extends west approximately 1.3 miles. At the west end it follows the right-of-way of an existing 115-kV transmission line, owned by WPS. The area is agricultural land.

Segment 202cx,y,z extends west for approximately 6.5 miles. It would follow the WPS 115-kV line crossing State Highway 97 and County Highway E. It ends at the intersection of segments 203 and 204. The area is mostly agricultural with intermittent wood lots.

Segment 203 extends north approximately 3.2 miles crossing State Highway 29. The segment then turns west and continues approximately 5 miles, crossing

County Highway F into Clark County. The segment crosses the Eau Pleine River, the Wisconsin Central railroad, and the North Fork Popple River. The segment ends at the Wisconsin Central railroad at segment 221. The area is comprised of agriculture and scattered forests.

Segment 221' extends northwest along the Wisconsin Central railroad for approximately 3.4 miles. The segment crosses the Black River and ends at the county line between Clark and Taylor County. The area consists of intermittent agricultural and forested land.

Segment 225 extends northwest approximately 2.5 miles along the Wisconsin Central railroad right-of-way to a point south of Lublin. The area is primarily agricultural.

Segment 227 extends west between the Wisconsin Central railroad and the Lakehead pipeline. The area crossed is agricultural.

Segment 229 follows the Lakehead pipeline west past Lublin for 4 miles. The segment ends at the intersection with segments 230. The area is comprised of wetlands and agricultural fields.

Segment 230 extends north approximately 2,500 feet from the Lakehead pipeline to the Wisconsin Central railroad. The area is primarily agricultural.

Segment 231 extends northwest along the Wisconsin Central railroad right-of-way. It extends approximately 1.8 miles, ending north of State Highway 73. The area consists of intermittent agricultural and forested land.

Segment 233 extends northwest approximately 2,500 feet, crossing over Hay Creek to the Lakehead pipeline right-of-way. It ends at the intersection with segment 235. The area crossed is agricultural land.

Segment 235 extends to the northwest around Gilman. The segment first runs northwest, then north across the Yellow River and State Highway 64. It ends at the intersection with the Lakehead pipeline northwest of Gilman. The land is mostly agricultural with a few wood lots.

Segment 236 extends north to the Wisconsin Central railroad, then northwest along that right-of-way. The segment angles away from the railroad temporarily near County Highway M and then enters Chippewa County. The total length is approximately 10 miles. The area consists of intermittent agricultural and forested land.

Segment 243x,y,z follows along a 115-kV line owned by NSP from Sheldon to a point east of Big Falls Dam, for a total distance of almost 17 miles. It crosses the Jump River near Sheldon, then State Highway 194. As it continues north, the segment crosses Skunk Creek and Main Creek. The existing line crosses Highway 8 approximately 2 miles east of Tony. The segment would turn to the northeast for approximately 3,000 feet then bends back to the north. The end of the segment is at the intersection with another 115-kV line, which runs from Big Falls Dam to Prentice. The area crossed is a mixture of forest and agricultural land.

Segment 142x,y,z extends north along an existing NSP 115-kV transmission line, for approximately 3,100 feet. It ends at the junction with another 115-kV transmission line. The segment crosses mainly agricultural land.

Segment 144# would begin by following the existing NSP 115-kV line west for approximately 1.3 miles. When the existing transmission line turns northwest into the Osprey Substation, the segment would continue west across the Flambeau River. The segment would then turn northwest, ending north of County Highway I. A majority of the area is forested. The length along the existing line would be rebuilt as double-circuit.

Segment 145a extends west to the north of County Highway I for approximately 6 miles. The area consists of intermittent forests and agricultural land.

Segment 145b angles northwest, then turns westerly and crosses the Thornapple River. It extends approximately 6 miles, crossing State Highway 27 and County Highway J and ends west of the Little Thornapple River. The area traversed is mostly forested.

Segment 149b crosses Bear Creek, heading northwest approximately 1.75 miles. It crosses County Highway J. It ends at the western side of the Wisconsin Central railroad line and the intersection with segments 152 and 302'. The segment crosses predominantly forested land.

Segment 152 extends northwest from the western side of the Wisconsin Central railroad right-of-way. It extends approximately 2,700 feet. The segment ends at segment 305. The area is a mixture of forest and open land.

Segment 305 follows the Wisconsin Central railroad right-of-way to the north for approximately 1 mile. It crosses the Chippewa River next to the railroad bridge. The area is primarily forested.

Segment 307 continues northwest along the Wisconsin Central railroad right-of-way for approximately 4 miles. The segment crosses State Highway 40. The segment turns north away from the railroad, for approximately 2,500 feet as it crosses into Sawyer County, then angles back to the railroad after it crosses Little Weirgor Creek. The area traversed is primarily forested.

Segment 309 extends northwest approximately 1,000 feet from the Wisconsin Central railroad to an existing 69-kV transmission line. The segment passes south of Exeland through a mixture of forest and agriculture. This segment marks the end of this route.

5. Segment Descriptions for Route 2.2 Weston to Exeland via Owen-Withee

Segment 1ax would originate at the Weston Substation and extend west along an existing WPS transmission line, approximately 1.7 miles, crossing the Wisconsin River. It would continue south approximately 2,300 feet, ending at the intersection with segments 1bx and 48. The segment would primarily cross a mixture of forests and wetlands with a small area of residential land present. The existing line would be rebuilt as a double-circuit line within the existing right-of-way.

Segment 1bx extends southwest, double-circuiting the existing 345-kV transmission line for approximately 1 mile. It ends at the intersection with segment 7a north of Spring Brook Road. This segment would primarily cross county forest land.

Segment 8ax extends southwest approximately 3,000 feet along the existing WPS 345-kV transmission line. The segment crosses County Highway KK. It ends at segment 8b#. The area is primarily residential and forest. The right-of-way would require 115 feet for a parallel circuit, or 40 feet for a double circuit/rebuild.

Segment 8b extends southwest approximately 2,000 feet, branching off from the existing right-of-way. It ends at the intersection with segments 11 and 12. The area is primarily within the County forest.

Segment 11 extends west for approximately 8.5 miles. It crosses Highways B, O, 107 and S. It ends at the intersection with segments 16 and 201 approximately one half-mile west of County Highway S. The segment would primarily cross agricultural land. All new right-of-way would be required.

Segment 201 extends west for approximately 31 miles. The segment crosses the Eau Pleine River, County Highway M, State Highway 97, County Highway E, and County Highway F. West of State Highway 13 the segment crosses the South Fork of the Popple River. North of Riplinger, the segment turns northwest, following the Wisconsin Central railroad right-of-way. It crosses County Highway N, west of Atwood, ending at segment 209. The segment crosses mostly agricultural land with some intermittent wood lots.

Segment 209 extends northwest, along the Wisconsin Central railroad right-of-way, for approximately three miles including a crossing of County Highway P. The segment ends at the intersection with an existing NSP transmission line. The land along the railroad is a mixture of forested and agricultural lands.

Segment 213' follows the existing NSP 115-kV line west from the Wisconsin Central railroad for approximately 7 miles. The segment crosses State Highway 73 and then the Black River. West of County Highway O, the segment turns north from the existing right-of-way. The portion of the segment from the Black River to the point where the segment turns north is proposed as double circuit only. It continues north approximately 1 mile and ends north of Airport Road. The area consists of intermittent agricultural and forested land.

Segment 223 extends north approximately 1.25 miles to State Highway 29. The segment continues north another 5 miles, ending at a Lakehead pipeline right-of-way south of the Clark County/Taylor County line. The area is comprised of intermittent agricultural and forested land.

Segment 226 extends northwest along the Lakehead pipeline for approximately 3 miles to a point south of County Highway A. The area is dominated by agricultural fields.

Segment 229 follows the Lakehead pipeline west past Lublin for 4 miles. The segment ends at the intersection with segment 230. The area is comprised of wetlands and agricultural fields.

Segment 230 extends north approximately 2,500 feet from the Lakehead pipeline to the Wisconsin Central railroad. The area is primarily agricultural.

Segment 231 extends northwest along the Wisconsin Central railroad right-of-way. It extends approximately 1.8 miles, ending north of State Highway 73. The area consists of intermittent agricultural and forested land.

Segment 233 extends northwest approximately 2,500 feet, crossing over Hay Creek to the Lakehead pipeline right-of-way. It ends at the intersection with segment 235. The area crossed is agricultural land.

Segment 235 extends to the northwest around Gilman. The segment first runs northwest, then north across the Yellow River and State Highway 64. It ends at the intersection with the Lakehead pipeline northwest of Gilman. The land is mostly agricultural with a few wood lots.

Segment 237 would parallel the eastern side of the Lakehead pipeline from Gilman into Chippewa County. The segment terminates at one endpoint of a 115-kV transmission line. It would pass through a mixture of agricultural land and forests.

Segment 239 begins near County Highway VV and runs northwest into Rusk County past Sheldon. The segment runs for approximately 6 miles, crossing the Jump River and the Little Jump River, as well as State Highway 194. The segment crosses a mixture of agriculture, forests, and wetlands.

Section 240 continues to the northwest along the Lakehead pipeline approximately 1.1 miles to Main Creek. The segment crosses mostly agricultural fields.

Segment 242' # would begin by crossing Main Creek, heading northwest. It parallels the Lakehead pipeline past the village of Conrath and the city of Ladysmith for a total of approximately 15.7 miles. It would diverge from the pipeline near Ricci Road to avoid some homes. The segment crosses State Highway 27 and then the Flambeau River. Northwest of the river the segment would include double-circuiting an existing NSP 69-kV transmission line for approximately 2.2 miles. The double-circuit portion would extend across U.S. Highway 8. The segment would continue northwest, crossing the Thornapple River and County Highway A. It crosses mostly forest, with a few agricultural fields.

Segment 301a' begins north of Town Line Road and follows the Lakehead pipeline northwest for approximately 1.5 miles. The area consists of predominantly agricultural fields as well as some forest and non-forested wetland.

Segment 301b continues northwest along the Lakehead pipeline about 0.5 miles to the Chippewa River crossing mostly forested land.

Segment 303 extends northwesterly approximately 1.3 miles crossing the Chippewa River and State Highway 40. The segment crosses agricultural fields and some woodland.

Segment 308' extends northwest approximately 2.7 miles. It crosses Big Weirgor Creek and ends at the intersection with a 69-kV transmission line. The area is primarily forested. This segment marks the end of this route.

6. Segment Descriptions for Route 3.1 Exeland to Oliver

Segment 311 extends to the northwest along the Lakehead pipeline, for approximately 2.7 miles. It ends at the intersection with segments 314 and 315. Forests dominate the area.

Segment 315 deviates northwest, away from the Lakehead pipeline and around two farmsteads, for approximately 1.9 miles. The segment crosses County Highway C. The area is primarily forested with some agricultural land present.

Segment 316 extends northwest, along the Lakehead pipeline, for approximately 3,300 feet. It crosses State Highway 48 and continues approximately 10,210 feet. It ends at segment 317. The area is mostly forested.

Segment 317 continues northwest along the Lakehead pipeline. It extends approximately 1 mile, crossing County Highway C. The area consists of primarily agricultural land.

Segment 319 extends northwest. It follows the Lakehead pipeline for approximately 4,700 feet. The segment ends at the intersection with segments 323 and 322. The area consists of primarily forest.

Segment 323 extends northwest along the Lakehead pipeline, for approximately 2.1 miles. It crosses the Tuscobia Park Falls State Trail. It ends south of the Lac Courte Oreilles Indian Reservation. The area consists of primarily forested lands.

Segment 324 turns west for approximately 3.5 miles. The segment then turns to the northwest for approximately 1.1 miles. It finally turns toward the north and continues for approximately 3.2 miles where it would intersect the Wisconsin Central railroad. Forests dominate the area.

Segment 328 turns northwest towards Stone Lake, along the Wisconsin Central railroad, for approximately 1.8 miles. It extends through a forested area.

Segment 334a follows the Wisconsin Central railroad for approximately 2,300 feet. The area is forested.

Segment 337a deviates from the Wisconsin Central railroad and extends north approximately 2.4 miles. It lies to the east of the community of Stone Lake. The segment crosses State Highway 70 and turns northeast. It heads northeast for approximately 3,500 feet, to a point south of Boylan Road. This segment was adjusted to avoid a nearby grass airfield. The area traversed is primarily agricultural.

Segment 337c extends north for approximately 2.1 miles, from Boylan Road towards the Stone Lake Substation. The area is a mixture of forest and agricultural land.

Segment 340x,y,z* heads north approximately 1,500 feet. It turns to the northwest and follows along the existing NSP 161-kV transmission line, approximately 1.4 miles. The segment ends at the intersection with segments 341# and 342. The area is mostly forested.

Segment 341# extends northwest following the existing NSP 161-kV transmission line and the Wisconsin Central railroad for approximately 3.8 miles. The segment is proposed as double-circuit only for approximately 1.2 miles at the northwest end. The area is a mixture of agricultural and forest land.

Segment 343x continues as a double-circuit rebuild northwest approximately 4,000 feet along the existing NSP 161-kV transmission line, but diverging from the Wisconsin Central railroad. The Lakehead pipeline is parallel to the existing transmission line. The area is forested.

Segment 346x heads northwest double-circuiting the existing NSP 161-kV transmission line parallel to the Lakehead pipeline. It extends approximately 1.7 miles, crossing the Namekagon River. The existing transmission line would be rebuilt as a double-circuit line within the existing right-of-way. The segment ends south of U.S. Highway 63. The area is mostly forest.

Segment 349x extends northwest approximately 1,500 feet, double-circuiting the existing NSP 161-kV transmission line. It extends from U.S. Highway 63 to Stanberry Lake. The area is mostly open.

Segment 352x crosses Stanberry Lake as a rebuild of the existing line and continues for a total of approximately 1.2 miles. The area consists of residential, agricultural and forested land.

Segment 357x,y,z extends northwest, along the existing NSP 161-kV transmission line right-of-way, for a distance of approximately 4.4 miles to State Highway 77. The segment continues along the right-of-way for approximately 6 more miles. It ends near the Douglas/Washburn County line. The area consists of forested land with some agricultural land present.

Segment 359# crosses the county line and the Totagatic River as it continues northwest for approximately 1.6 miles. At the county line, the ownership of the existing 161-kV transmission line changes from NSP to Superior Water, Light & Power, a subsidiary of Minnesota Power (MP). The area is comprised of intermittent forest and agricultural land.

Segment 360x,y,z follows the existing MP 161-kV transmission line right-of-way and the Lakehead pipeline northwest for approximately 6.4 miles, crossing County Highway G southeast of Gordon. It also crosses the Eau Claire River and County Highway Y as it passes by the east side of Gordon. The area is predominantly forested except in Gordon.

Segment 367'x,y,z* runs from Gordon to Solon Springs. The segment crosses the St Croix River and U.S. Highway 53 on the north side of Gordon. North of Gordon, the segment follows an abandoned railroad, which is now a snowmobile trail. The segment turns northwest, away from the transmission line near the Solon Springs airport to prevent conflict with the glide path into the runway. The total length is approximately 5.9 miles. The area consists of intermittent forest and open land.

Segment 372'x,y,z* turns west along the existing MP 161-kV transmission line right-of-way, which intermittently parallels the Lakehead pipeline. The segment angles north at County Highway A then turns northwest across County Highway L and County Highway V and ends at the intersection with an east-west Northern Natural Gas pipeline. The area is mostly forest with some clearings for agricultural land.

Segment 377x,y,z continues northwest, along the existing MP 161-kV transmission line and, Lakehead pipeline, for approximately 1.6 miles. The segment ends at an abandoned railroad, which is now a snowmobile trail. The area consists of intermittent forests and agricultural land.

Segment 379x,y,z* follows northwest along the existing MP 161-kV transmission line, and the Lakehead pipeline. The segment extends approximately 1.8 miles to County Highway E. The area consists of intermittent forests and agricultural land.

Segment 385x,y,z turns due north, along the existing MP161-kV transmission line, east of Lyman Lake Road, for approximately 2.5 miles. It crosses Bluff Creek and ends south of County Highway Z. The existing line continues north into the Stinson Substation in Superior. The area consists of agricultural land with some forested sections.

Segment 392 turns west approximately 1.5 miles, crossing Bear Creek and then following the DM&IR railroad right-of-way. The area consists of forested land.

Segment 393 extends west along the DM&IR railroad right-of-way for approximately 6.2 miles. The segment crosses Bluff Creek, County Highway A, Crawford Creek, the Nemadji River, State Highway 35, the Pokegama River, and the Little Pokegama River. The segment angles northwest towards the west end as it approaches Oliver. The area consists of intermittent forest and agricultural land.

Segment 394x extends westward as a double-circuit rebuild of the existing MP115-kV transmission line. The existing line crosses the DM&IR railroad tracks then follows a path between the railroad tracks and State Highway 105. The area is mostly forested.

Segment 397x follows the existing right-of-way west for approximately 1 mile, as a double-circuit rebuild parallel to the DM&IR railroad and State Highway 105. The segment passes through the village of Oliver and ends at the St Louis River, which is the Minnesota-Wisconsin state line. The area is a mix of residential and commercial property.

The project continues north along an existing transmission line into Minnesota as a double-circuit rebuild to the Arrowhead Substation. That portion of the project is covered under an application to the Minnesota Environmental Quality Board.

7. Segment Descriptions for Route 3.2 Exeland to Oliver

This route begins west of Exeland with segment 312x,y,z, which follows a 69-kV transmission line to the northeast for approximately 1 mile. It crosses State Highway 48 and the Wisconsin Central railroad. The segment then turns north

and continues along the existing transmission line for approximately 3.9 miles. It ends at the intersection with segments 320 and 321. The area is predominantly forest.

Segment 321 turns west from the existing transmission line for approximately 3.2 miles, crossing the Little Weirgor Creek. It ends at the intersection with the Wisconsin Central railroad. The area is primarily forested.

Segment 322 continues west from the Wisconsin Central railroad to the Lakehead pipeline for approximately 2.5 miles. It crosses County Highway C and Swift Creek. The area is forested.

Segment 323 turns northwest along the Lakehead pipeline, for approximately 2.1 miles. It ends south of the Lac Courte Oreilles Indian Reservation. The area consists of primarily forested lands.

Segment 325 is a short 500-foot segment along the Lakehead pipeline between segments 324 and 326. The area is comprised of forest.

Segment 326 turns west for approximately 2 miles, along the south edge of the Lac Courte Oreilles Indian Reservation. The segment then turns north along the west edge of the reservation for approximately 1.4 miles. The segment crosses the Wisconsin Central railroad and ends at the intersection with the Lakehead pipeline. The area consists primarily of forested land.

Segment 329 follows the Lakehead pipeline approximately 4,000 feet northwest. It separates from the pipeline right-of-way for approximately 6,200 feet. It passes through predominantly forested land.

Segment 330x extends northwest, along the Lakehead pipeline and the existing 69-kV line, for approximately 2,700 feet. The line passes between Hungry Lake and Ham Lake. The area has been cleared for agriculture and housing. The line would be rebuilt as double circuit, with the existing 69-kV line, for this segment.

Segment 332ax heads north-northwest along the Lakehead pipeline and 69-kV transmission line, and crosses State Highway 27. The segment passes between Lower and Upper Holly Lake on the east side and Mud Lake and Sand Lake to the west. The segment turns northwest along the existing transmission line, separating from the pipeline, for approximately 2,800 feet. It crosses County Highway E, then turns northwest to rejoin the pipeline. The area is primarily forested. The proposed option for this segment is double-circuit, with the existing 69-kV line.

Segment 332cx, a double-circuit rebuild, follows the existing 69-kV transmission line to the west across State Highway 27 and then turns north. The total length of the segment is approximately 3.2 miles. It crosses McLeod Road, and ends at the intersection with the Lakehead pipeline. The area is primarily agricultural, with some commercial and residential development, primarily to the south.

Segment 339 extends to the northwest for approximately 4,900 feet to bypass the Stone Lake Substation. This substation marks the southern end of a 161-kV line from the Stinson Substation in Superior, Wisconsin. The area is predominantly forest.

Segment 340x,y,z* turns to the northwest and follows along the existing NSP 161-kV transmission line, approximately 1.6 miles. The segment ends at County Line Road, which divides Sawyer and Washburn counties. The area is mostly forested.

Segment 341# extends northwest, following the NSP 161-kV transmission line, approximately 3.8 miles. The existing transmission line parallels the Wisconsin Central railroad. The northwest end of the segment would be double-circuit as the line passes by some small lakes and wetlands. The area is a mixture of agricultural and forest.

Segment 344x extends northwest approximately 2,300 along the Wisconsin Central railroad. The construction of this segment would involve relocating the existing 161-kV line so that the line would be double circuit. The area traversed consists of agricultural land.

Segment 347x continues northwest along the Wisconsin Central railroad as a double-circuit relocation of the existing 161-kV transmission line. The segment extends approximately 2.3 miles, crossing a railroad and the Namekagon River. It turns northeast and crosses U.S. Highway 63, where it meets the existing transmission line and Lakehead pipeline right-of-way. The area consists of agricultural land.

Segment 351 extends northeast approximately 1,500 feet, southeast of Stanberry Lake. It ends at the intersection with segments 348 and 353. The line would require new right-of-way. The area consists of agricultural and forested land.

Segment 353 extends north approximately 1,600 feet. It ends at the intersection with segments 355' and 354. The area consists of forested land.

Segment 355' extends north approximately 4 miles. It crosses the Chippanazie Creek and ends north of State Highway 77. The area consists of forested land.

Segment 356 extends northwest approximately 10.8 miles. It crosses Frog Creek and Black Brook, the Totagatic River and the Ounce River. The segment ends near Claire Lawler Road. The area is predominantly forest.

Segment 362 extends northwest approximately 1.4 miles, crossing County Highway G. The area is comprised mainly of forest with some agricultural land present.

Segment 363 extends northwest approximately 2.7 miles, crossing the Eau Claire River. The segment ends north of County Highway Y. The area is comprised of forest.

Segment 365 extends approximately 4.1 miles to the northwest. It crosses the Lower Ox Creek, which is a tributary of the St Croix River. The area is predominantly forest.

Segment 368 extends northwest approximately 2.2 miles. The segment crosses the St Croix River south of Upper St Croix Lake, the Wisconsin Central railroad, and ends at Business Highway 53. The area consists of forest and agricultural land.

Segment 371 continues northwest across new U.S. Highway 53 southwest of Solon Springs. The segment ends at the abandoned railroad, which is now a snowmobile trail. The area contains commercial, forest and agricultural land.

Segment 398 turns north, along the old railroad right-of-way for approximately 2,800 feet. It crosses to the right-of-way of U.S. Highway 53 and continues north for approximately 2,100 feet. The segment angles away from the highway, to the northwest for approximately 3,400 feet, and crosses County Highway A. The segment then turns northeast, for approximately 2,400 feet, and follows the Highway 53 right-of-way. The total length is approximately 4.8 miles. The segment ends north of Solon Springs. The area consists of primarily forested land.

Segment 399 follows along U.S. Highway 53 for approximately 12.3 miles. The highway passes east of the communities of Bennett and Hawthorne. The segment ends at a Northern Natural Gas pipeline. The area consists of primarily forested land with some agricultural land present.

Segment 373b turns west along the Northern Natural Gas pipeline. It extends approximately 3.4 miles to an abandoned railroad that is now a snowmobile trail. The area primarily consists of forests with some agricultural land present.

Segment 376 extends west, along the Northern Natural Gas pipeline right-of-way approximately 1.5 miles from the snowmobile trail to the MP 161-kV transmission line. The area consists of intermittent forests and agricultural land.

Segment 378 continues west along the Northern Natural Gas pipeline right-of-way for approximately 2.7 miles, crossing the Little Amnicon River and County Highway K. The area consists of mostly forest with some agricultural land present.

Segment 382 continues west, deviating temporarily from the Northern Natural Gas pipeline to avoid some residences. It follows the pipeline right-of-way, crossing County Highway A, and continues westward for a total of approximately 2.3 miles. The area consists of mostly forested land with agricultural along the last section.

Segment 384 follows the Northern Natural Gas pipeline right-of-way west, then northwest, continuing for approximately 5.9 miles. Along the westward portion it crosses Copper Creek, State Highway 35, Stoney Brook Creek. When the segment turns northwest, it crosses the Black River, a Wisconsin Central railroad and the Nemadji River. After it turns north, the segment crosses County Highway C and a rail line. The area is mostly agricultural land with concentrations of forest around the waterways.

Segment 395 extends north approximately 1.8 miles, crossing the Pokegama River. The area consists of forested land with a few agricultural fields present.

Segment 396 extends north approximately 2.1 miles on the east edge of Oliver, crossing the north and south branch of the Little Pokegama River. It ends at the existing MP transmission line next to State Highway 105. The area consists of forests.

Segment 397x follows the existing right-of-way west for approximately 1 mile, as a double-circuit rebuild parallel to the DM&IR railroad and State Highway 105. The segment passes through the village of Oliver and ends at the St Louis River, which is the Minnesota-Wisconsin state line. The area is a mix of residential and commercial property.

The project continues north along an existing transmission line into Minnesota as a double-circuit rebuild to the Arrowhead Substation. That portion of the project is covered under an application to the Minnesota Environmental Quality Board.

8. Segment Descriptions for Route 4.1
Tripoli to Rhinelander

Segment 401x begins at the Highway 8 Substation and follows the existing WPS 115-kV transmission line, which would be rebuilt as a double-circuit line. The segment first crosses the Wisconsin River then turns west along State Highway 17 for a total length of approximately 3,000 feet.

Segment 402x follows the existing WPS transmission line south for approximately 3,800 feet as a double-circuit line, crossing State Highway 17. The segment passes west of an elementary school.

Segment 405x crosses State Highway 17 and continues south as a double-circuit line for approximately 2.3 miles. The area consists of intermittent residential and wooded land.

Segment 409x continues southwest, double-circuiting the existing 115-kV transmission line. It extends approximately 1 mile to Hat Rapids Road. The area consists of intermittent forested and agricultural area.

Segment 415z* extends south parallel to the existing WPS transmission line for approximately 7 miles. The segment crosses Squaw Creek and Mail Route Road. The segment leaves the transmission line right-of-way and turns west for approximately another 7 miles. The segment follows County Highway A across the Wisconsin River to U.S. Highway 51. The segment consists primarily of forested land, with some residential areas present along County Highway A.

Segment 473' extends west along County Highway A. The segment jogs south then west, crossing an abandoned rail line that has been converted to a trail. It crosses the Tomahawk River and ends at the south end of the Tomahawk Railway railroad. The area crossed is a combination of commercial, residential and undeveloped land.

Segment 474' follows County Highway CC west. The road zigzags northwesterly for approximately 3 miles. The segment then continues west along Somo Dam Drive, crossing the Little Somo River at the south end of Somo Lake. The segment continues west for a total of approximately 12.9

miles, crossing the Somo River, following School Road, and an abandoned railroad and crosses County Highway T. The area is heavily forested.

Segment 36v is considered only as a 115-kV segment, since connecting 345-kV options were dropped from the analysis. The segment extends west approximately 1.4 miles, crossing Flannigan and Squaw Creeks to substation site 1 near the Oneida/Price County line. The area traversed consists of forested land.

Segment 476 extends west for approximately 1,300 feet to County Highway YY, then turns north and continues approximately 3,500 feet to substation site 2. The area consists of intermittent forested and agricultural land.

Segment 108b extends west for approximately 4 miles to substation site 8, the endpoint for the 115-kV analysis. This segment could be constructed as either 115-kV or 345-kV depending on the substation site selected. If sites 1 or 2 were selected in conjunction with segment 34, the segment would be built as 345-kV. If site 8 or 9 were selected in conjunction with segment 29, then segment 108b would be built as a 115-kV line. Forests are predominant in the area.

9. Segment Descriptions for Route 4.2 Tripoli to Rhinelander

Segment 401x begins at the Highway 8 Substation and follows the existing WPS 115-kV transmission line, which would be rebuilt as a double-circuit line. The segment first crosses the Wisconsin River then turns west along State Highway 17 for a total length of approximately 3,000 feet.

Segment 402x follows the existing WPS transmission line south across State Highway 17 for approximately 3,800 feet as a double-circuit line. The segment passes west of an elementary school.

Segment 405x crosses State Highway 17 and continues south as a double-circuit line for approximately 2.3 miles. The area consists of intermittent residential and wooded land.

Segment 409x continues southwest, double-circuiting the existing 115-kV transmission line. It extends approximately 1 mile to Hat Rapids Road. The area consists of intermittent forested and agricultural area.

Segment 410 turns west along Hat Rapids Road for approximately 1.6 miles. It crosses the Wisconsin River and turns north along River Road then turns west

and follows Fire Tower Road. The total length is approximately 2.8 miles. The area consists of intermittent agricultural and forested land.

Segment 411 extends southwest along the ANR pipeline right-of-way for approximately 2 miles, crossing Crescent Creek before joining segment 412. The area consists primarily of forested land.

Segment 412 turns west along Fire Tower Road for approximately 1.3 miles. The segment crosses Jennie Creek. The area consists of agricultural and forested land.

Segment 414 turns north along Spring Creek Drive for approximately 4,800 feet. The segment then turns west and parallels U.S. Highway 8 for approximately 1.5 miles. The area consists of intermittent agricultural and forested land.

Segment 424a continues west along U.S. Highway 8 approximately 4,500 feet. The segment ends at Manson Lake. The area consists of forested land.

Segment 424b heads southwest along U.S. Highway 8 approximately 2.2 miles. The segment crosses from Oneida into Lincoln County. The area consists of forested land with a residential area along the north shore of Manson Lake.

Segment 427 extends southwest, along U.S. Highway 8, for a distance of approximately 4,100 feet. The segment ends at U.S. Highway 51. The area is mostly wooded.

Segment 429b heads southwest along the exit ramp leading from U.S. Highway 51 to Highway 8.

Segment 433a' begins by crossing U.S. Highway 51, then follows U.S. Highway 8 for a total of approximately 1 mile. The edge of the highway is mostly wooded.

Segment 433d follows U.S. Highway 8 for approximately 2.2 miles as it curves south and then north around Clear Lake. The segment ends at the northwest end of Clear Lake. The area is mostly wooded.

Segment 435 extends southwest along U.S. Highway 8 approximately 1.3 miles. The segment crosses the Tomahawk River and ends at the Tomahawk Railway railroad. The area consists of intermittent forested and agricultural land.

Segment 438 heads west along U.S. Highway 8 for approximately 6.7 miles. The segment crosses Hay Creek and Johnson Creek. The Wisconsin Central railroad is adjacent to the highway for approximately 3 miles. The area consists of mostly forested land with some agricultural land and a few residences along the highway.

Segment 487 heads northwest along U.S. Highway 8 for approximately 4,200 feet. The area consists of intermittent forest and agricultural land.

Segment 444 heads west along U.S. Highway 8. It extends approximately 2.7 miles. The segment crosses the Somo River, Rennhak Creek, and Hauser Creek. The area consists of intermittent agricultural and forested lands.

Segment 449 is a connection from U.S. Highway 8 northwest to the Wisconsin Central railroad right-of-way. The length is approximately 1,300 feet. The area consists of forested land.

Segment 450 heads north and west, along the Wisconsin Central railroad for approximately 1.3 miles. The segment crosses Brant Creek. The area consists of intermittent agricultural and forested land.

Segment 451 extends west across Willow Road passing north of Tripoli. It follows the Wisconsin Central railroad for approximately 3,300 feet. The area consists of forested land interspersed with residences.

Segment 455 follows the Wisconsin Central railroad southwest across Ruth Road to U.S. Highway 8. The area consists of forested land.

Segment 457 extends approximately 600 feet, from the Wisconsin Central railroad across U.S. Highway 8. The segment follows U.S. Highway 8 for approximately 2,200 feet ending at segment 458. The area is primarily agricultural.

Segment 458 extends west along U.S. Highway 8 approximately 4,600 feet ending at segment 462. The area consists of intermittent forested and agricultural land.

Segment 462 extends west along U.S. Highway 8 for approximately 1,100 feet to County Highway YY, which is the Oneida/Price County line. The area consists of primarily forested wetland and forest.

Segment 467 continues west along U.S. Highway 8 approximately 3,500 feet. The segment crosses County Highway YY and Somo Creek ending at segment 469. The east half of the area is agricultural land and the west half is forested.

Segment 469 continues west along U.S. Highway 8 south of Brantwood for approximately 3.3 miles. It crosses River Road, Creek Road, County Highway D and Stadium Road. The segment ends at West Knox Road. The area primarily consists of agricultural land with some patches of woods.

Segment 482 turns south, along West Knox Road, for approximately 2.8 miles. The segment ends at substation site 9. The area consists of intermittent agricultural and forested land. This segment marks the end of Route 4.2 for the 115-kV analysis.

Substation descriptions are provided in Section III. G of this worksheet.

**10. Segment Descriptions for Route 4.3
Tripoli to Rhinelander**

Segment 401x begins at the Highway 8 Substation and follows the existing WPS 115-kV transmission line, which would be rebuilt as a double-circuit line. The segment first crosses the Wisconsin River then turns west along State Highway 17 for a total length of approximately 3,000 feet.

Segment 402x follows the existing WPS transmission line south across the highway for approximately 3,800 feet as a double-circuit rebuild. The segment passes west of an elementary school.

Segment 405x crosses State Highway 17 and continues south as a double-circuit line for approximately 2.3 miles. The area consists of intermittent residential and wooded land.

Segment 409x continues southwest, double-circuiting the existing 115-kV transmission line. It extends approximately 1 mile to Hat Rapids Road. The area consists of intermittent forested and agricultural area.

Segment 410 turns west along Hat Rapids Road for approximately 1.6 miles. It crosses the Wisconsin River and turns north along River Road then turns west and follows Fire Tower Road. The total length is approximately 2.8 miles. The area consists of intermittent agricultural and forested land.

Segment 411 extends southwest along the ANR pipeline right-of-way for approximately 2 miles, crossing Crescent Creek before joining segment 412. The area consists primarily of forested land.

Segment 412 turns west along Fire Tower Road for approximately 1.3 miles. The segment crosses Jennie Creek. The area consists of agricultural and forested land.

Segment 414 turns north along Spring Creek Drive for approximately 4,800 feet. The segment then turns west and parallels U.S. Highway 8 for approximately 1.5 miles. The area consists of intermittent agricultural and forested land.

Segment 424a continues west along U.S. Highway 8 approximately 4,500 feet. The segment ends at Manson Lake. The area consists of forested land.

Segment 490 turns northwest from U.S. Highway 8 to the Wisconsin Central railroad, a distance of approximately 1,700 feet. The area consists of forested land.

Segment 423b turns southwest along the Wisconsin Central railroad for approximately 2.1 miles. The segment crosses Birch Bay Road and ends at U.S. Highway 51. The area is mostly wooded.

Segment 431' turns north along U.S. Highway 51. It extends approximately 2.5 miles, crossing County Highway N. The segment turns west, running cross-country for approximately 1.2 miles. It joins with an old railroad grade and follows it southward for approximately 1,500 feet. The segment then turns and heads west for approximately 2.4 miles, crossing the old Highway 51 and the Tomahawk River. The segment turns to the south, along Lee Road for approximately 1,400 feet then turns west again for approximately 2,800 feet, along Prairie Rapids Road. The segment ends at Lund Road. The area is primarily forested land, much of which is pine plantations.

Segment 440a continues west along Prairie Rapids Road for approximately 4,900 feet to County Highway Y. The area is forested.

Segment 441a follows Prairie Rapids Road west for approximately 2,500 feet, then turns south for approximately 2,200 feet. The segment ends at segment 441b. The area consists of mostly forested land with pockets of residential areas.

Segment 441b turns west for approximately 2,800 feet, crossing the Little Rice River and Little Rice Dam Road. The segment turns south along Little Rice Dam Road to Old 8 Drive, which is the county line between Oneida and Lincoln counties. The segment turns west and follows Old 8 Drive for approximately 2.9 miles. The total length of the segment is approximately 5.0 miles. The area consists of forested land.

Segments 442 and 475 continue west along Old 8 Drive for approximately 4,400 feet and 1,400 feet respectively, crossing over the Wisconsin Central railroad and ending at U.S. Highway 8. The area consists of forested land.

Segment 477 turns north along McCord Road for approximately 400 feet to the Wisconsin Central railroad right-of-way. The area is wooded.

Segment 447 turns northwest along the Wisconsin Central railroad for approximately 3 miles. The segment crosses Rennhak Creek and Hauser Creek. The area consists of intermittent forested land with a residential area at the eastern end.

Segment 450 heads north and west, along the Wisconsin Central railroad for approximately 1.3 miles. The segment crosses Brant Creek. The area consists of intermittent agricultural and forested land.

Segment 451 extends west across Willow Road passing north of Tripoli. It follows the Wisconsin Central railroad for approximately 3,300 feet. The area consists of forested land interspersed with residences.

Segment 455 follows the Wisconsin Central railroad southwest across Ruth Road to U.S. Highway 8. The area consists of forested land.

Segment 457 extends approximately 600 feet, from the Wisconsin Central railroad across U.S. Highway 8. The segment follows U.S. Highway 8 for approximately 2,200 feet. The segment ends at segment 458. The area consists of agricultural area.

Segment 458 extends west along U.S. Highway 8 approximately 4,600 feet. The segment ends at segment 462. The area consists of intermittent forested and agricultural land.

Segment 462 extends west along U.S. Highway 8 for approximately 1,100 feet to County Highway YY, which is the Oneida/Price County line. The area consists of primarily forested wetland and forest.

Segment 471 turns south along County Highway YY for approximately 3.4 miles. The segment ends at substation site 2. The area is primarily forested.

The substation descriptions are included in Section III. G. of this worksheet.

In order to compare the Tripoli to Rhinelander options on an equal basis requires having two common endpoints. In this case, the endpoints are the Highway 8 Substation and the Tripoli siting area of sites 8 and 9. For comparison purposes therefore, this route would include the use of segment 108bw, as a 345-kV line, to substation site 8. Segment 108bw extends approximately 4 miles west to West Knox Road through mostly forest land.

11. Segment Descriptions for Segments not Used in Routes

The following segments were identified as possible segments during the routing analysis, but were not included in any of the routes submitted for consideration. Data for these routes is included in most of the figures. Refer to Figure A7-5 for a list of unused segments.

Segment 7b extends west approximately 1,100 feet along the north side of Spring Brook Road. The segment ends at the intersection of segments 12 and 14a. The area traversed consists of primarily forested land.

Segment 12 extends northwest approximately 3,200 feet from segment 8b. It ends at the intersection of segment 7 and leads to Segment 14. The segment crosses primarily forested areas on new right-of-way.

Segment 14a extends northwest approximately 4,400 feet. It ends at the intersection of segments 14b, 48 and 49. The segment crosses an area consisting of forest.

Segment 17 extends north approximately 1,200 feet connecting segments 16 and 20. The segment crosses primarily agricultural land.

Segment 26 extends approximately 4 miles northwest from segment 20. The segment crosses County Highways A and S before crossing a tributary of the Big Rib River. It then continues northwest, crossing County Highway F. It ends at Wozniak Road. The land traversed is mostly forested.

Segment 28 extends north from segment 24b' to segment 34, a distance of approximately 5.3 miles, crossing the Big Rib River and State Highway 64. The segment crosses from Marathon County into Lincoln County. The segment crosses predominantly forested land.

Segment 47 extends north from substation site 8 to site 9, approximately 3,200 feet. The segment crosses through predominantly forested land, west of West Knox Road.

Segment 108av,w spans the 1,000 feet from segment 38 to the Lincoln/Price County line, also known as Squaw Creek Road. The substation may be located in this space; however, the exact location has not been defined at this time.

Substation descriptions are provided in Section III. G of this worksheet.

Segment 117 extends approximately 4,100 feet in a northwesterly direction providing a crossover from segment 112 to 119. It would pass through forest land.

Segment 121 extends northwest from segment 118 to segment 123 southeast of Prentice, a distance of a little over a mile. It crosses Morner Road and Douglas Creek. The area consists of forested land.

Segment 137w,x extends due west approximately 5.2 miles towards Big Falls Dam. It ends at the junction with the existing 115-kV transmission line west of County Highway X. The land traversed is predominantly forested.

Segment 141 extends west approximately 1.4 miles from segment 135x to 155a. The segment crosses predominantly forested land.

Segment 157 runs north from the existing NSP transmission line to the south for approximately 2.2 miles. It ends at the intersection with segments 155a and 155b. The area consists of forested land.

Segment 204x,y,z extends west approximately 1 mile from segment 202cx,y,z. It crosses Town Line Road and Marsh Creek. The segment ends at the intersection with segment 205. The area is predominantly agricultural. The line could be built as either double circuit or parallel to the existing line.

Segment 205x extends southwest from the existing transmission line to Elderberry Road for approximately 3,000 feet to avoid a wetland mitigation area. The segment then turns northwest for approximately 2,000 feet. It ends at the intersection with segment 207x,y,z*. The segment would include relocating the existing transmission line along with the construction of the new line. The area consists of agricultural land.

Segment 207x,y,z* follows the existing WPS 115-kV line. It extends west approximately 1 mile before crossing the Big Eau Pleine River. It continues approximately 3 miles to the crossing of new State Highway 13 south of Abbotsford. Where the existing line crosses the new highway interchange the only option for the project would be to rebuild the existing line as double-circuit. Otherwise, the option of parallel construction would be available. The segment ends at the intersection with segment 211. The area consists of agricultural and forested land. From Hiline Drive west, the existing 115-kV line is owned by NSP. The existing NSP line is scheduled to be rebuilt at 161-kV and a portion will be re-routed. Therefore, the west portion of segment 207x,y,z* would be vacated right-of-way at the time of construction for the Arrowhead to Weston Project and the project is proposed as single-circuit only.

Segment 211 extends west approximately 4,900 feet along the right-of-way of an existing NSP 115-kV transmission line. As mentioned under segment 207, this line is supposed to be relocated. The area is primarily agricultural with some wood lots.

Segment 224 extends north approximately 2,000 feet from the Lakehead pipeline right-of-way to the Clark/Taylor county line. The area is comprised of intermittent agricultural and forested land.

Segment 238x,y,z turns northeast for approximately 1.3 miles past the east side of a Lakehead pipeline pumping station and a NSP substation. The segment crosses the Wisconsin Central railroad at the Chippewa/Rusk county line. The right-of-way crosses a mixture of agricultural and forested areas.

Segment 310 extends north from the Lakehead pipeline along an existing 69-kV line for approximately 2.6 miles. It ends at Deer Lake Road west of Exeland. The land is forested.

Segment 314 follows the Lakehead pipeline to the northwest. It extends approximately 1.8 miles across Deer Lake Road to a point south of State Highway 48. The area consists of intermittent forest and agricultural land.

Segment 320x,y,z follows the 69-kV transmission line north for approximately 1.4 miles. The segment then turns to the northwest, leaving the existing line for approximately 1.8 miles. The segment rejoins the 69-kV line and continues approximately 9.5 miles, crossing the Couderay River once and State Highway 27 twice. The segment ends at the intersection of the transmission line and the Lakehead pipeline. The predominant land cover is forest. This segment passes through approximately 4 miles of the Lac Courte Oreilles Indian Reservation.

Segment 327 follows the Lakehead pipeline across the Lac Courte Oreilles Indian Reservation for approximately 3.8 miles. It crosses the Wisconsin Central railroad and Summit Creek. The segment ends at the west edge of the reservation. The area is forested.

Segment 331 extends north and then northeast for approximately 1.7 miles, where it meets the existing NSP transmission and Lakehead pipeline rights-of-way. The area is forested along the southern portion and agricultural along the northern portion of the segment.

Segment 332b extends northwest for approximately 3,500 feet along the Lakehead pipeline. The segment ends where it intersects with the NSP electric transmission line that runs north to Hayward. The area crossed is primarily agricultural land.

Segment 342 extends northwest approximately 2,900 feet along the Lakehead pipeline. The segment then runs west of the Wisconsin Central railroad. It crosses County Highway E and returns to the pipeline and railroad right-of-way for a total distance of approximately 4.3 miles. The area is primarily forested land.

Segment 345x extends northwest approximately 1,700 feet between the Wisconsin Central railroad and the existing NSP 161-kV transmission line. The area consists of forested land.

Segment 348w,x extends north approximately 2,700 feet across U.S. Highway 63, connecting segments 346 and 353. The area consists of a mixture of agricultural and forested land.

Segment 354x extends northwest approximately 4,300 feet. It crosses County Highway M and Chippanazie Creek. The segment would be double-circuit because it would include the relocation of the existing line. The area is primarily forested.

Segment 364' extends northwest approximately 1.6 miles. It turns due north and continues approximately 6.9 miles, crossing County Highway A and Lower Ox Creek. The segment then turns west for a distance of approximately 1.5 miles. It ends at the St. Croix Creek north of Upper St. Croix Lake after a length of 10.0 miles. The area consists of forested land.

Segment 374a crosses County Highway P and extends westward approximately 2.3 miles to U.S. Highway 53. The area consists of forested land.

Segment 386 follows northwest along the Lakehead pipeline right-of-way. It extends approximately 2.9 miles, crossing two branches of Bluff Creek. The segment ends at the DM&IR railroad and leads to segment 393. The area is mostly forested with a short section of agricultural land.

Segment 403x extends southwest along State Highway 17 for approximately 3,900 feet. The segment ends at the intersection of segments 405x and 404x. The area consists of forested land. The segment would be built as double-circuit, relocating the existing line from the opposite side of the highway.

Segment 404x runs south along State Highway 17. It extends approximately 2.3 miles as a double-circuit relocation. The area consists of agricultural land.

Segment 407x continues south along State Highway 17 for approximately 1 mile, then turns west and continues approximately 2,000 feet along Hat Rapids Road. The segment ends at the existing WPS transmission line to the Highway 8 Substation. The area consists of intermittent agricultural and forested land.

Segment 413 extends southwest, along the ANR pipeline right-of-way, for approximately 1.4 miles. The segment crosses Jennie Creek and the Oneida/Lincoln County line. The area consists of forested land.

Segment 418 continues southwest along the ANR pipeline right-of-way for approximately 2,900 feet. The area consists of forested land.

Segment 420 extends southwest, along the ANR pipeline right-of-way, approximately 3,200 feet. The segment leads to segment 422. The area consists of forested land.

Segment 422 extends southwest along the ANR pipeline right-of-way for approximately 3.9 miles. The segment crosses Spring Creek, Spring Creek Drive, and Lily Lake Road. At Mountain Drive it diverts from the pipeline right-of-way and continues for approximately 2.2 miles to U.S. Highway 51. The area consists primarily of forested land, with patches of agricultural land.

Segment 423a extends west approximately 1 mile from U.S. Highway 8 to the Wisconsin Central railroad. The area consists of forested land.

Segment 425 runs northwest along U.S. Highway 51 from the Oneida County line. It extends approximately 5,000 feet. The segment ends at the Wisconsin Central railroad. The area consists of forested land.

Segment 428 extends north approximately 3,100 feet from U.S. Highway 8 along U.S. Highway 51. The area consists of forest.

Segment 429a runs southwest along U.S. Highway 51 for approximately 700 feet. The area consists of forested land.

Segment 430 runs south along U.S. Highway 51 from the U.S. Highway 8 interchange to the point where the ANR pipeline crosses the highway, a length of approximately 2.8 miles. The area consists of forested land.

Segment 437' follows the Tomahawk Railway railroad north from Lake Mohawksin for approximately 2.2 miles to U.S. Highway 8. The area consists of intermittent residential, agricultural, and forested land.

Segment 448 runs west along U.S. Highway 8 towards Tripoli. The segment crosses Brant Creek then turns to the north along Willow Road. The segment ends at the Wisconsin Central railroad with a total length of approximately 1.8 miles. The area consists of intermittent residential, agricultural, and forested land.

Segment 456 extends west along U.S. Highway 8 for approximately 2,600 feet. The area consists of agricultural land.

Segment 459 extends west along U.S. Highway 8 for approximately 3,700 feet. The area is agricultural land.

Segment 465' heads southwest along the Wisconsin Central railroad. It extends approximately 2,400 feet. It crosses Somo Creek and U.S. Highway 8. The area consists of agricultural and residential land.

Segment 466 extends north for approximately 1,000 feet, along County Highway YY, between U.S. Highway 8 and the Wisconsin Central railroad. The segment crosses Somo Creek.

Segment 468' runs northwest along the Wisconsin Central railroad for approximately 12,500 feet. The area is mostly agricultural with some forested areas present.

Segment 470a heads west along the Wisconsin Central railroad. It extends approximately 1.3 miles, crossing County Highway D. The area consists of intermittent agricultural and forested land.

Segment 470b turns south for approximately 3,600 feet from the Wisconsin Central railroad to U.S. Highway 8. The area consists of forested land.

Segment 472 extends south along U.S. Highway 51 to County Highway A for approximately 2,600 feet. The area is predominantly agricultural.

Segment 478 runs north along West Knox Road. It extends approximately 3,200 feet across Knox Creek from segment 110 to 109. The area is forested.

Segment 481 runs west along the Wisconsin Central railroad for approximately 1,100 feet to the Oneida/Price County line. The area is forested.

Segment 483 extends north approximately 500 feet between segments 107 and 108. It follows County Highway YY. The area is wooded.

- C. Detailed route segment analysis (tabular format to include: length, new right of way required, existing right of way, percent and type of corridor sharing, type of land use and zoning, agricultural land, forest land, recreational land, commercial/industrial land).

See Figures A7-1 to A7-4 which lists segments within each proposed route.

See Figures A8-1 to A11-2 which list transmission lines, railroads, pipelines, and roads that run adjacent to proposed segments.

See Figures A12-1 through A12-14 which are route summary tables that provide a summary of segment information for each route.

- D. Summary of segment analysis by route (tabular format)

See Figure A13-1 which shows summary information for each route.

- E. Provide information on endangered and threatened species.

This summary is intended to be utilized in conjunction with Figure A14-1 to A14-5 to summarize the impacts to endangered or threatened resources within the proposed routes of the Arrowhead to Weston 345-kV transmission project. Figure A14 provides an "Impact Reference" number which corresponds to the appropriate environmental impact explanation in the summary below. Through consultation with the Bureau of Endangered Resources, a search of the Natural Heritage Database was conducted to determine sensitive species and areas that are located within the proposed route.

Figure A14 and the summary below address the impacts to threatened and endangered resources associated with the proposed Arrowhead to Weston Project. The purpose of the endangered and threatened categories as written in s. 29.604(1), Stats. is “...certain wild animals and wild plants are endangered or threatened and are entitled to preservation and protection...within their respective jurisdictions to assure their continued survival and propagation...”

The definition of Endangered as contained in s. 29.604(2)(a), Stats. is “...any species whose continued existence as a viable component of this state’s wild animals or wild plants is determined by the department to be in jeopardy on the basis of scientific evidence.” The definition of threatened as contained in s. 29.604(2)(b), Stats. is “...any species of wild animals or wild plants which appears likely, within the foreseeable future, on the basis of scientific evidence to become endangered.”

A third, Special Concern category, which does not appear in s. 29.604, Stats. or Federal Statutes has been developed by the Bureau of Endangered Resources in Wisconsin. The definition of Special Concern as contained in Bureau of Endangered Resources documentation for the Wisconsin Natural Heritage Program is “...those species about which some problem of abundance or distribution is suspected but not yet approved.” Wisconsin Department of Natural Resources.

Special concern species and natural areas are not addressed in the table and summary because impacts to those resources are addressed as part of the environmental review of the project. The environmental review summarizes the acreage of impacts to various land uses, habitats and vegetative cover. The numbers in parenthesis before each species description correspond to impact reference numbers in Figure A14.

1) *Clemmys insculpta*, wood turtle

Wood turtles prefer lowland hardwood forests and open wet meadows associated with medium to fast current streams and rivers with sand or gravel substrates. Wood turtles may forage in upland deciduous mesic forests and open meadows in the summer. South facing sandy riverbanks, flat sandy soil openings, gravel banks, roadsides, fields and meadows adjacent to the river are utilized for nesting sites. The wood turtles are active terrestrially from March to November of each year. Project impacts to the turtles could be minimized through all of the following:

- Avoid construction and construction vehicle traffic within a 50-foot buffer along both stream banks and within the stream itself.
- Avoid construction within 366 meters of the banks of the streams in the turtle areas from June to late September (egg laying and hatching time).

Should construction be required to within the period of time from June to late September, the area could be surveyed by a qualified biologist. Once the areas which the turtles inhabit are identified, these areas could be avoided to minimize the impacts to the turtles.

- Implement proper erosion control methods to minimize or prevent transport of sediment to the stream during rainfall events.

2) *Haliaeetus leucocephalus*, bald eagle

Although the bald eagles themselves would not be impacted directly, their nesting areas, foraging areas, daytime perching areas, and night roosts could be impacted. Bald eagles prefer to maintain their nests in large supercanopy trees. More often than not, nests are utilized several years in a row. This allows for documentation of the location of these nests. In the State of Wisconsin, bald eagle nest locations are documented. Therefore, it is possible to avoid impacts to nesting activities by identifying the locations of bald eagle nests within ¼ mile of the proposed project route. Once the nests are identified either through use of the database or field survey, the U.S. Fish and Wildlife Service Guidelines could be followed to minimize the impacts to nesting activities.

Perching and roosting also involves utilization of super canopy trees. Although the impacts to super canopy trees could not be totally avoided because of the project requirement for a right-of-way cleared of woody vegetation, impacts to these bald eagle activities could be mitigated to some extent. Impacts to foraging areas could be minimized by both avoiding construction and construction vehicle traffic within a 50-foot buffer along stream banks and within the stream itself and implementing proper erosion control methods to eliminate transport of sediment to the stream during rainfall events.

3) *Pandion haliaeetus*, osprey

Like the bald eagle, the osprey prefers to utilize supercanopy trees. Although the ospreys themselves would not be impacted directly, their nesting areas, foraging areas, daytime perching areas, and night roosts could be impacted. Ospreys historically have preferred to maintain their nests in large supercanopy trees, but with the development of the osprey platform many ospreys would rather build their nests on the platforms. More often than not, nests are utilized several years in a row. This allows for documentation of the location of these nests. Therefore, it is possible to avoid impacts to nesting activities by identifying the locations of the nests. If nests are in the path of the proposed route, a platform could be constructed and the nest could be transferred to the

nesting platform. This practice has been conducted with great success throughout the United States.

Ospreys are also much more tolerant to human activity than bald eagles. Therefore, dependent upon the location of the nest, (near a highway or railroad), the bald eagle guidelines may not need to be followed to eliminate disturbance during nesting. Perching and roosting also involves utilization of super canopy trees. Although the impacts to super canopy trees could not be totally avoided because of the project requirement for a right-of-way cleared of woody vegetation, impacts to these osprey activities could be mitigated. Impacts to foraging areas could be minimized by both avoiding construction and construction vehicle traffic within a 50-foot buffer along both stream banks and within the stream itself and implementing proper erosion control methods to eliminate transport of sediment to the stream during rainfall events.

4) *Cyclonaias tuberculata*, purple wartyback mussel

The purple wartyback mussel requires medium-sized rivers with water ranging from five feet in slow to moderate current. Substrate requirements are rocky areas with gravel or cobble. Project impacts to the mussels could be prevented through the following process:

- Avoid construction and construction vehicle traffic within a 50-foot buffer along both stream banks and within the stream itself.
- Implement proper erosion control methods to minimize or prevent transport of sediment to the stream during rainfall events.

5) *Plethobasus cyphus*, bullhead mussel

The bullhead or sheepnose mussel, requires medium to large rivers. Substrate requirements are gravel or mixed sand and gravel. Project impacts to the mussels could be prevented through the following process:

- Avoid construction and construction vehicle traffic within a 50-foot buffer along both stream banks and within the stream itself.
- Implement proper erosion control methods to minimize or prevent transport of sediment to the stream during rainfall events.

6) *Ophiogomphus howei*, pygmy snaketail dragonfly

The pygmy snaketail dragonfly prefers clean, fast-flowing, small to large-sized streams with gravel or sand substrates in heavily forested watersheds. Since

the adults are highly mobile, and could feed in forested, shrubby and grassy vegetation, the project should have very minimal impact upon them. The larvae reside in the river and stream substrate to feed and then crawl ashore to molt into adults. All of the larval activities, mating, and egg laying occurs within the stream or within a couple of feet of the stream. Therefore, project impacts to the larvae, mating and egg laying activities could be prevented through the following process:

- Avoid construction and construction vehicle traffic within a 50-foot buffer along both stream banks and within the stream itself.
- Implement proper erosion control methods to minimize or prevent transport of sediment to the stream during rainfall events.

7) *Ophiogomphus anomalus*, extra-striped clubtail dragonfly

The extra-striped clubtail or snaketail dragonfly prefers fast-flowing, medium-sized, warm water streams (100 to 800 ft. wide) with abundant gravel and excellent water quality in heavily forested watersheds. Since the adults are highly mobile, and could feed in forested, shrubby and grassy vegetation, the project should have minimal impact upon them. The larvae reside in the river and stream substrate to feed and then crawl ashore to molt into adults. All of the larval activities, mating, and egg laying occurs within the stream or within a couple of feet of the stream. Therefore, project impacts to the larvae, mating and egg laying activities could be prevented through the following process:

- Avoid construction and construction vehicle traffic within a 50-foot buffer along both stream banks and within the stream itself.
- Implement proper erosion control methods to minimize or prevent transport of sediment to the stream during rainfall events.

8) *Emydoidea blandingii*, blanding's turtle

Blanding's turtles prefer shallow and deep marshes, the shallow bays of lakes and reservoirs, shallow, slow-moving streams and rivers, and backwater sloughs with soft bottoms and aquatic vegetation. Blanding's turtles may forage in upland areas and in the water. Upland sandy soil openings up to 1.5 miles from the water are utilized for nesting sites. The blanding's turtles are active terrestrially from April to November of each year. Project impacts to the turtles could be minimized/prevented through all of the following:

- Avoid construction and construction vehicle traffic within a 50-foot buffer along both stream banks and within the stream itself.
- Avoid construction within 1.5 miles of the banks of the streams in the turtle areas from June to late September (egg laying and hatching time). Should construction be required to be conducted within the period of time from June to late September, the area could be surveyed by a qualified biologist. Once the areas in which the turtles inhabit are identified, these areas could be avoided to minimize the impacts to the turtles.
- Implement proper erosion control methods to minimize or prevent transport of sediment to the stream during rainfall events.

9) *Ophiogomphus susbecha*, St. Croix snaketail dragonfly

The St. Croix snaketail dragonfly prefers fast-flowing, clean, larger streams with abundant gravel, cobble, and sand substrate in heavily forested watersheds. Since the adults are highly mobile, and could feed in forested, shrubby and grassy vegetation, the project should have very minimal impact upon them. The larvae reside in the river and stream substrate to feed and then crawl ashore to molt into adults. All of the larval activities, mating, and egg laying occurs within the stream or within a couple of feet of the stream. Therefore, project impacts to the larvae, mating and egg laying activities could be completely minimized/prevented through the following process:

- Avoid construction and construction vehicle traffic within a 50-foot buffer along both stream banks and within the stream itself.
- Implement proper erosion control methods to minimize or prevent transport of sediment to the stream during rainfall events.

10) *Moxostoma valenciennesi*, greater redhorse

The greater redhorse prefers clear waters of medium to large-sized rivers, reservoirs, and large lakes at depths of less than 3 feet over sand, gravel or boulders. Project impacts to the fish could be minimized/prevented through the following process:

- Avoid construction and construction vehicle traffic within a 50-foot buffer along both stream banks and within the stream itself.
- Implement proper erosion control methods to minimize or prevent transport of sediment to the stream during rainfall events.

11) *Lampsilis teres anodontoides*, yellow sandshell mussel

The yellow sandshell mussel, requires large, swift rivers with sandy bottoms and a water depth of greater than 1 meter. Project impacts to the mussels could be minimized/prevented through the following process:

- Avoid construction and construction vehicle traffic within a 50-foot buffer along both stream banks and within the stream itself.
- Implement proper erosion control methods to minimize or prevent transport of sediment to the stream during rainfall events.

12) *Petatsites sagittatus*, arrowhead sweet-coltsfoot

The arrowhead sweet-coltsfoot is an emergent aquatic and prefers, low, wet, marshy areas. A survey along proposed routes in Douglas and Washburn Counties has been conducted for this species in potential habitat areas. Avoidance of the areas where the plants reside along with proper erosion control measures would minimize or prevent any impacts to this species.

13) *Gynus buccinator*, trumpeter swan

Trumpeter swans prefer an interspersed of open water and emergent marsh habitat in isolated areas away from human disturbance. Impacts to the trumpeter swans could be minimized or prevented by avoiding construction during the period from March to October.

14) *Vaccinium vitis-idea ssp minus*, mountain cranberry

The mountain cranberry prefers open bogs and acid peatlands. A survey along the proposed route for this species could be conducted in potential habitat areas. Avoidance of the areas where the plants reside along with proper erosion control measures would minimize or prevent any impacts to this species.

15) *Calypso bulbosa*, fairy slipper

The fairy slipper prefers deep moist coniferous forests and white cedar swamps. A survey along the proposed route for this species could be conducted in potential habitat areas. Avoidance of the areas where the plants

reside along with proper erosion control measures would minimize or prevent any impacts to this species.

16) *Sparganium glomeratum*, northern burr-reed

The northern burr-reed prefers bogs and shallow water areas. A survey for this species along the proposed route is currently being conducted under guidance from the Bureau of Endangered Resources. Avoidance of the areas where the plants reside along with proper erosion control measures would minimize or prevent any impacts to this species.

17) *Eleocharus nitida*, slender spike-rush

The slender or neat spike-rush prefers wet soil areas where recent disturbance has eliminated competitive vegetation for a period of time. A survey for this species along the proposed route is currently being conducted under guidance from the Bureau of Endangered Resources. Avoidance of the areas where the plants reside along with proper erosion control measures would minimize or prevent any impacts to this species.

18) *Ranunculus cymbalaria*, seaside crowfoot

The seaside crowfoot prefers sandy or muddy shores or marshes, ditches and harbors along Lake Michigan or Superior, often in brackish or alkaline places. A survey for this species along the proposed route is currently being conducted under guidance from the Bureau of Endangered Resources. Avoidance of the areas where the plants reside along with proper erosion control measures would minimize or prevent any impacts to this species.

19) *Ranunculus gmelinii*, small yellow water crowfoot

The small yellow water crowfoot prefers cold brooks and springs, shallow water and muddy shores of ditches, streams and lakes. A survey along proposed routes in Douglas and Washburn Counties has been conducted for this species in potential habitat areas under guidance from the Bureau of Endangered Resources. Avoidance of the areas where the plants reside along with proper erosion control measures would minimize or prevent any impacts to this species.

20) *Parnassia palustris*, marsh grass of parnassus

The marsh grass of parnassus prefers wet, seepy meadows with sandy or clayey soil. A survey along proposed routes in Douglas and Washburn Counties has

been conducted for this species in potential habitat areas under guidance from the Bureau of Endangered Resources. Avoidance of the areas where the plants reside along with proper erosion control measures would minimize or prevent any impacts to this species.

21) *Lepomis megalotis*, longear sunfish

The longear sunfish prefers clear, shallow, moderately-warm, still water of streams, rivers or lakes over rubble, gravel and sand with moderate aquatic vegetation. Project impacts to the fish could be minimized/prevented through the following process:

- Avoid construction and construction vehicle traffic within a 50-foot buffer along both stream banks and within the stream itself.
- Implement proper erosion control methods to minimize or prevent transport of sediment to the stream during rainfall events.

F. Provide information on historic sites, including archeological sites.

Investigations for the project included a review of State Historical Society of Wisconsin records by a qualified archaeologist to determine the location of any known cultural resource sites and/or the results of past cultural resource surveys associated with the project alternative route segments. Following identification of known cultural resource sites, The State Historical Society and Public Service Commission of Wisconsin staff were consulted with to prescribe specific avoidance and/or mitigation measures for each site.

Figure A15-1 provides a summary of the known cultural resource sites associated with the project. Information regarding the specific locations and features of known cultural resource sites is confidential and managed by the State Historical Society of Wisconsin. To insure the locations of known cultural resource sites are kept confidential, the results of cultural resource investigations and agency communications were provided to the PSCW separate from this application.

Upon final route approval by the PSCW, the findings of the original investigation would be verified with the State Historical Society. If the PSCW approves a transmission line route that passes through an identified cultural resources site that is prescribed to be surveyed in advance of construction activities, a qualified archaeologist would complete the field investigation work. Consultation with the State Historical Society and the PSCW would continue should structure relocations be needed to avoid potential cultural resources.

In the event that an archaeological site is accidentally discovered during construction, work would cease in the area until the site could be properly investigated. Any accidental discoveries would be reported to the State Historical Society and construction would proceed based upon consultation with that agency. Construction inspectors would receive and/or have received training to assist them in identification of cultural resource remains should they be accidentally discovered.

See Figures A15-1 and A15-2, which show a summary of known cultural resource sites associated with the project.

- G. List the number of each building and facility type within these distance categories: 0-50 feet, 50-100 feet, and 150-300 feet. Distances measured from the centerline.

See Figures A16-1 to A16-12 which show homes and other facilities within 300 feet of the centerline of each segment.

1. Homes

See Figure A16.

2. Apartments

See Figure A16.

3. Schools

See Figure A16.

4. Day-care centers

See Figure A16.

5. Hospitals

See Figure A16

6. Nursing homes

See Figure A16.

7. Parks

See Figure A16.

8. Playgrounds

See Figure A16.

9. Agricultural outbuildings

See Figure A16.

10. Commercial/industrial, office buildings

See Figure A16.

H. Describe agricultural land use, by route.

1. Type of farming

The following descriptions provide an overview of each of the sectors within the study area. The specific data for each route is contained in the figures at the end of this worksheet. Cattle grazing takes place throughout the area. Herds may be moved to different locations on a daily basis. The cattle are often controlled by using temporary electric fences.

a. Routes 1.1, 1.2 and 1.3

These routes are located in Marathon, Lincoln, Taylor, Price and Rusk Counties. They would begin in Marathon County, located in the Northern Highland of central Wisconsin. The primary agricultural activity in the project area is dairy farming. Hay and pasture account for a large portion of the agricultural land. A majority of field crops grown are used as feed for livestock to support dairy farming. Ginseng is also grown in the project area as a specialty crop. Most of the ginseng grown in the project area is located in the vicinity of Marathon City and Edgar.

b. Routes 2.1 and 2.2

These routes would be located in Marathon, Clark, Taylor, Chippewa and Rusk Counties. They would begin in Marathon County, located in the Northern Highland of central Wisconsin. The primary agricultural activity in the project area is dairy farming. Hay and pasture account for a large portion of the agricultural land. A majority of field crops grown are used as feed for livestock to support dairy farming. Ginseng is also grown in the project area as a specialty crop. Other agricultural products produced in the region include meat and vegetables.

c. Routes 3.1 and 3.2

These routes would be located in Sawyer, Washburn and Douglas counties. They would begin in Sawyer County, located in the west-central region of Wisconsin. The primary agricultural activities in the project area are dairy farming and livestock production. Corn and hay production is present in the area. Most farm land is used for pasture and raising livestock. Cranberries are also grown in bogs and marshes as a specialty crop.

d. Routes 4.1, 4.2 and 4.3

These routes would be located in Oneida and Lincoln counties. They would begin in Oneida County, located in the Northern Highlands of the north-central region of Wisconsin. Agricultural activity in the project area consists primarily of corn for silage, oats and hay. Specialty crops produced in the project area include potatoes, strawberries and snap beans. Cranberries are also grown in areas comprised of peat bogs.

See Figures A17-1 to A17-6 which show the type of agricultural land each segment crosses.

2. Is central pivot irrigation used and is there a potential for interference with irrigation?

There are no known center pivot or other types of irrigation systems in use in the project area that would be affected by any of the routes being considered.

3. Potential interference with aerial seeding or spraying, windbreaks, or drainage tiles. Will line be within 300 feet of outbuildings or will it affect farmland preservation plans?

Aerial spraying of croplands is primarily associated with irrigated agriculture, which is not found in the project area. Therefore, there is minimal potential for the proposed routes to result in interference with aerial crop spraying or seeding.

See Figure A-16 for the number of outbuildings.

There is no anticipated effect on existing farmland preservation plans.

I. Describe wetlands by segment and provide original WDNR wetland maps for routes (use WDNR classification system).

Following is a general description of wetlands type found within the project area.

The entire project area was shaped by glacial activity some 10,000 years ago. When the glaciers retreated, they left behind a relatively flat surface with many scour holes and a covering of various glacial till and debris. Glacial melt waters formed the rivers that flow through the project area and the scoured depressions were transformed into lakes. These conditions were conducive to the development of a variety of wetlands, which are generally characterized as forested, shrub, or emergent wetlands.

Forested wetlands in the project area typically consist of northern wet forest in the wetter areas and northern wet-mesic forest in the drier, but still very moist habitats. Northern wet forests are dominated by black spruce (*Picea mariana*) and tamarack (*Larix laricina*) while species such as white cedar (*Thuja occidentalis*), balsam fir (*Abies balsamea*), and jack pine (*Pinus banksiana*) are of secondary importance. These forests develop on acid peats and are also characterized by an understory with sphagnum mosses, sedges (*Carex*), and ericaceous shrubs such as rosemary (*Andromeda glaucophylla*), leatherleaf (*Chamaedaphne calyculata*), bog laurel (*Kalmia polifolia*), and Labrador tea (*Ledum groenlandicum*).

Two types of northern wet-mesic forests are present in the project area and include cedar swamps and hardwood swamps. The cedar swamp is dominated by white cedar and balsam fir. Eastern hemlock (*Tsuga canadensis*) Yellow birch, black ash, and American elm (*Ulmus americana*) are of secondary importance. The hardwood swamp is dominated by black ash, with yellow birch (*Betula lutea*), red maple (*Acer rubrum*), and white cedar being of secondary importance. Cedar swamps are typically found more towards the wetter end of the wet-mesic forest continuum and the hardwood swamps more towards the drier end.

Scrub/shrub wetlands in the project area are mostly dominated by speckled alder. These alder thickets are not very diverse but sometimes include understory species such as *Galium asprellum*, *Campunula aparinoides*, *Potentilla palustris*, and Kentucky bluegrass (*Poa palustris*). Alder thickets are typically found along springy areas with mineral or muck soils, along streams, and around lakes.

Emergent wetlands in Northern Wisconsin are usually characterized by a dominant presence of sedges rather than grasses. Northern sedge meadows are typically dominated by tussock sedge (*Carex stricta*) with a high presence of bulrush (*Scirpus*) species as well. Some grasses that are common include bluejoint grass (*Calamagrostis canadensis*), and Kentucky bluegrass. Sedge meadows are

commonly found in extinct lake beds, around the shores and banks of lakes and streams, and in glacial depressions.

Bogs are found in glacial outwash depressions and are dominated by floating mats of sphagnum mosses. Other common plants in bogs include ericaceous shrubs, sedges and insectivorous species such as pitcher plant (*Sarracenia purpurea*). Bog plants must be able to withstand highly acidic conditions.

See Figures A18-1 to A18-6 which contain information on the type of wetlands each segment crosses.

Project wetland maps were submitted to the PSCW under separate cover.

J. List any stream or river crossings.

See Figures A19-1 and A19-2 for a list of segments that cross streams and rivers.

See Figures A20-1 to A20-3 for visual simulations of the Namekagon River crossing. The three sets of photos show the existing transmission line crossing of the river and what it would look like if the proposed line were built (segment 346x). The photo of the proposed crossing is a computer simulation of what the proposed rebuild would look like from a canoe on the river. The proposed crossing would consist of a double-circuit rebuild of the existing line within the existing right-of-way.

K. Describe forest lands by segment.

1. Include type of woodlands, dominant species, age, ownership (private, county forest). Give basic use (recreation, timber).

Following is a general description of forest type found within the project area.

Sectors 1, 2, and 4 are in a landscape with primarily mixed coniferous-deciduous forests. The common tree species in this area include hemlock (*Tsuga canadensis*), sugar maple (*Acer saccharum*), yellow birch (*Betula lutea*), trembling aspen (*Populus tremuloides*), big toothed aspen (*Populus grandidentata*), paper birch (*Betula papyrifera*) white pine (*Pinus strobus*), red oak (*Quercus rubra*) and red pine (*Pinus resinosa*). Various combinations of these species dominate in different areas, depending on the richness of the soil, availability of moisture, and time since the last disturbance (i.e. wind blow-down, fire, silviculture).

Sector 3 contains a landscape with three different community types: mixed coniferous- deciduous forest in Rusk and Sawyer Counties, jack pine scrub oak

forest and barrens in Washburn and southern Douglas Counties, and boreal forest in northern Douglas County.

The jack pine scrub oak forest and barrens (pine barrens) are plant communities that occur on sandy soils and are dominated by small trees, low shrubs, and grasses. The dominant tree is jack pine (*Pinus banksiana*) with Hill's oak (*Quercus ellipsoidalis*) being a subordinate species that grows in a shrub-like form due to being knocked back by frequent fires. Pine barrens have a diverse shrub layer with the common species being blueberry (*Vaccinium angustifolium*), redroot (*Ceanothus ovatus*) and huckleberry (*Gaylussacia baccata*).

Boreal forests border the southern rim of Lake Superior and are dominated in the canopy by balsam fir (*Abies balsamea*). Other common canopy and sub-canopy species include white spruce (*Picea glauca*), white pine (*Pinus strobus*), white cedar (*Thuja occidentalis*), white birch (*Betula papyrifera*), three species of aspen (*Populus*), and three species of maple (*Acer*).

See Figures A21-1 to A21-6 for information on forests by type and land ownership. The length through public lands includes parcels that are part of the PCA land purchase recently announced by the Wisconsin DNR.

2. Contacts for obtaining the management plan or additional information.

See Figures A6-1 and A6-2 which list contacts related to forest plans.

L. Describe recreational lands impacted (parks, playgrounds, within 300').

See Figures A16-1 to A16-12 which summarize route segment information. A list of County Recreation Plans is provided in Figures A6-1 and A6-2.

M. List all airports and airstrips, by segment, whose operation could be affected by the proposed line.

Route segments were placed to avoid conflicts with airfields by avoiding the flight paths for known airfields.

See Figure A22-1 which lists airfields and airports that are within 2 miles of possible segments.

III. Substation Information (Drawing or diagrammatic format)

The proposed transmission line project would involve three substations within Wisconsin. The Weston 345-kV Substation would be built on the Weston Power Plant site. The proposed 115-kV line to serve Rhinelander would connect the existing Highway 8 Substation in Rhinelander to the proposed Tripoli Substation west of Rhinelander. The new equipment at the Highway 8 Substation would be installed within the existing fenced area. The layouts for each substation are shown in Figures A23-1 to 23-6.

There are four potential locations for the Tripoli Substation. The general locations have been identified, but the exact locations would be determined at a later date. The selected substation would require the purchase of 10 acres of land, approximately 2.75 acres for the fenced area of the substation and the remainder for access, parking and a buffer.

- A. The location, dimensions, and layout for any new substation or proposed additions to an existing substation.

The locations of the Weston, proposed Tripoli, and Highway 8 substations are shown in Figures A4-2, A4-19, and A4-20, respectively. See Figures A23-1 to A23-6 for layouts of the substations.

- B. Size (acres) of the land purchase required and orientation of the substation within the purchase parcel.

Ten total acres would be purchased for the site selected for the Tripoli Substation. The fenced area of the substation would require 2.75 acres and the remaining 7.25 acres would provide space for access, parking and act as a buffer.

See Figures A23-1 to A23-4 for conceptual layouts of the possible Tripoli Substation sites.

- C. Construction procedures and proposed landscaping.

Placement of the electric transmission/distribution substation would alter the site land area. The alternative substation sites are upland areas with primarily forest and shrub vegetation. Areas adjacent to the sites are upland forest and some wetland areas. Approximately 2.75 acres of a 10-acre parcel of land to be acquired for the substation would be disturbed by construction activities.

Vegetation would be removed from the construction area by a contractor and disposed of in an approved manner. To assist in screening the site, vegetation outside the construction area would be left undisturbed on the substation property.

During construction, the extent of earth disturbances would be minimized. Topsoil would be stripped and stockpiled for finish grading and seeding of disturbed areas outside the substation fence perimeter and along the access road. Any excess topsoil would be removed and disposed of in an approved manner. The construction area would be cut and filled to achieve the prescribed substation grade elevations. Areas outside of cut and fill grading areas would be protected against unnecessary equipment traffic. The construction contractor would provide any needed additional fill materials from an offsite location.

Existing drainage patterns would be altered during topsoil removal and site grading activities. Prior to the beginning of grading activities, a silt fence and/or straw bails would be installed around the perimeter of the construction area. Temporary erosion and sedimentation control measures would be designed and implemented to prevent sediments from being displaced and carried outside active construction areas and off-site. Work associated with erosion and sedimentation control would be done in compliance with the Wisconsin Department of Natural Resources', "Wisconsin Construction Site Best Management Practices Handbook." Temporary erosion control measures would be checked for effectiveness and maintained as necessary throughout the construction period.

The fenced substation area and access road would be surfaced with gravel aggregate. The contractor would provide the gravel aggregate from an offsite location. Once subsurface and surface substation facilities are placed and vegetation has been re-established on adjoining disturbed areas, any erosion caused by construction activities should be eliminated. Vegetation remaining on the adjacent substation property would be left undisturbed to allow thick growth to maximize site-screening benefits. No special landscaping is proposed.

See Figures A23-1 to A23-6 for proposed substation layouts.

D. Plat and topographic maps showing the location of the substations.

The maps were submitted to the PSCW under separate cover. See Figures A4-2, A4-19, and A4-20 for the locations of substations.

E. Location of all overhead transmission lines entering and leaving the substation. Provide details on any turning structures that might impact adjacent landowners (size, type of structure, guying, etc.)

See Figures A23-1 to A23-6 for proposed substation layouts.

- F. Details on any permanent access roads required (width, length, location, etc.)

See Figures A23-1 to A23-6 for proposed substation layouts.

- G. General environmental information including land use and zoning impacts to wetlands, forest, agricultural land, and endangered resources.

1. Tripoli Site 1

Substation site 1 is located on the border of Price and Lincoln Counties in section 25, Township 35N, Range 3E and section 30, Township 35N, Range 4E. It is located along County Highway YY near the intersection of segments 34 and 476. Most of the area is forested except the area east of the highway and south of segment 476. Squaw Creek runs north of the site. Wetlands are located along the creek and within a drainageway that runs southeast of the site. Both Lincoln County (east side of Highway YY) and Price County (west side of Highway YY) have zoned this area as agricultural.

2. Tripoli Site 2

Substation site 2 is also located on the border of Price and Lincoln Counties, in section 24, Township 35N, Range 3E and section 19, Township 35N, Range 4E. It is located off of Highway YY at the east end of segments 107 and 108. The west side of the road is forested, while the east side had been cleared for crop land. Squaw Creek runs southwest of the site. Wetlands associated with the creek are located on both sides of the road. Both Lincoln County (east side of Highway YY) and Price County (west side of Highway YY) have zoned this area as agricultural.

3. Tripoli Site 8

Substation site 8 is located in Price County in Sections 20 and 21, Township 35N, Range 3E. It is located off of West Knox road near the intersection of segments 108 and 478. The west side of the road is entirely forested. The east side has been cleared for pasture south of segment 108, and north of Old Mill Road. Knox Creek runs to the north and east of the site. The land adjacent to the creek is considered forested wetlands. The entire area is zoned agricultural.

4. Tripoli Site 9

Substation site 9 is located in Price County in Sections 16 and 17, Township 35N, Range 3E. It is located off of West Knox road at the intersection of

segments 109 and 478. Both sides of the road are primarily forested, although the west side has undergone some selective clearing. Knox Creek passes south of the site. The area south of segment 109 and the east side of the road is largely forested wetlands. The entire area is zoned as agricultural.

IV. EMF Information

A. Identify existing electric distribution facilities.

See Figures A24-1 and A24-2 which list existing distribution lines along 115-kV segments.

B. Provide detailed EMF profiles for each structure type being considered.

1. Provide EMF estimates of new lines for anticipated normal load (normal load is defined as 80% of peak load - system normal) and peak load (100% peak load - system normal) (in amps).

See Figure A25-1 to 25-6 which shows calculated electric field data.

See Figures A26-1 to A26-22 which show calculated magnetic field data.

2. Provide EMF estimates for 1 meter above the ground, and at 0 feet (centerline at mid-span), 25 feet, 50 feet, 100 feet, 150 feet, 200 feet, and 300 feet either side of the line. (Report resultant field in milligauss, mG).

See Figure A25-1 to 25-6 which shows calculated electric field data.

See Figures A26-1 to A26-22 which show calculated magnetic field data.

3. Provide EMF estimates for the first year of operation, and at 10 years in the future.

See Figure A25-1 to 25-6 which shows calculated Electric Field data.

See Figures A26-1 to A26-22 which show calculated Magnetic Field data.

4. Provide all the assumptions used to model the EMF levels.

- a. Pole design diagram showing dimensions of pole arms and conductor locations. (Show conductor horizontal distance from pole and conductor distance from ground).

Arrowhead to Weston - Figures A1-1 to A1-6 show the possible structure types.

Tripoli to Rhinelander - Figures A1-7 and A1-8 show the possible structure types.

- b. Height of lowest conductor at mid-span

Arrowhead to Weston - the height of the lowest conductor for the 345-kV line would be 30 feet above ground.

Tripoli to Rhinelander - the height of the lowest conductor for the 115-kV line would be 24.5 feet above ground.

- C. For existing substations, provide EMF measurements around the perimeter and within the substation. Measurements to be shown on a diagram of the substation. Include:

- 1. Readings at each corner and mid-way along each fence. Take additional readings out from each fence reading at 25-foot intervals out to 100 feet from the substation.

See Figure A27-1 which shows magnetic field measurements for the Highway 8 Substation.

- 2. Readings at the fence where overhead and underground lines enter and leave the substation. Only one reading at the fence is necessary.

See Figure A27-1 which shows magnetic field measurements for the Highway 8 Substation.

V. Noise Information

- A. Projected noise levels at the proposed Tripoli 345/115-kV substation.

See Figure A28-1 which shows measured noise levels for a comparable substation.

- B. Estimated noise level of the 345-kV transmission line based on measurements taken along existing single and double circuit lines of similar construction type and voltage.

See Figures A28-2 to A28-4 which show measured noise levels on comparable transmission lines. Figure A29-1 contains the measured noise level data in table form.

See Figure A30-1 to 30-6 which shows calculated noise level values for the possible transmission line configurations.

VI. Other Agency Correspondence

- A. Provide copies of your correspondence with other agencies.

Figure A31 is a collection of letters submitted to agencies.

- B. Provide copies of their responses to your inquiries regarding the project.

- 1. Wisconsin Department of Transportation

Figure A32 is a collection of responses from agencies.

- 2. WDNR i.e., Bureau of Endangered Resources

Figure A32 is a collection of responses from agencies.

- 3. Department of Agriculture, Trade, and Consumer Protection
(Agricultural Impact Statement)

Figure A32 is a collection of responses from agencies.

- 4. State Historical Society of Wisconsin (SHSW): information on all routes and sites from the state listing of historic places; SHSW recommendations

Figure A32 is a collection of responses from agencies.

C. List permits

1. Federal Aviation Administration

- A Notice of Construction or Alteration may be necessary for segments near some municipal airports

2. National Park Service

- Approval to cross the St. Croix National Scenic River (Namekagon River)

3. U.S. Army Corps of Engineers

- Section 404 permits
- Section 10 of the River and Harbor Act for crossings of the St. Louis, Namekagon, Chippewa, and Wisconsin Rivers

4. Lac Courte Oreilles Indian Tribe (U.S. Bureau of Indian Affairs)

- Permits and approvals to use tribal lands

5. Wisconsin Department of Natural Resources

- Chapter 30 permits
- Stormwater discharge construction permit
- Approval to cross agency owned and managed lands
- Endangered species incidental take authorization
- 401 water quality certification (prior to issuance of any applicable federal permits).
- 6F approvals for lands subject to Federal Conservation Funding requirements
- County forest withdrawal approvals

6. Wisconsin Department of Transportation

- Highway & road crossings
- Construction along roads & highways in public rights-of-way
- Occupancy and tree clearing permits

7. Wisconsin Bureau of Aeronautics

- Notices/permits/approvals to erect high structures

8. Public Service Commission of Wisconsin
 - Certificate of Public Convenience and Necessity
9. Wisconsin Department of Agriculture, Trade, and Consumer Protection
 - Agricultural impact statement preparation
10. State Historical Society of Wisconsin
 - Approval of plans for the protection of cultural resources
11. Minnesota Environmental Quality Board (Minnesota portion only)
 - MP is pursuing an “Application for Exemption from the Power Plant Siting Act” for the portion of the project that is within Minnesota.
12. Counties
 - a. Non-highways
 - Building permits for substations
 - Permits to cross county-owned lands
 - Floodplain and shoreline zoning permits
 - Variances, land use permits, conditional use permits, site plan approvals
 - Notices/permits/approvals to erect high structures
 - b. Highways
 - Highway & road crossings
 - Construction along roads & highways in public rights-of-way
 - Occupancy and tree clearing permits
13. Local Cities and Townships
 - a. Non-roads
 - Building permits for substations
 - Shoreline zoning permits (for incorporated municipal governments)
 - Variances, land use permits, conditional use permits, site plan approvals

- Notices/permits/approvals to erect high structures

b. Roads

- Highway & road crossings
- Construction along roads & highways in public rights-of-way
- Occupancy and tree clearing permits

14. Railroads and Pipeline Companies (non-government)

- Permits or easements to cross or occupy shared rights-of-way

VII. Agency and Property Owner Information

A. Provide separate alphabetized lists for each of the groups described below.

1. Property owners along each transmission line route and adjacent to any substation included in the project.

The Property Owner/Interested Party mailing list was submitted to the PSCW under separate cover.

2. Include any public property, such as schools or other government land.

The referenced mailing list was submitted to the PSCW under separate cover.

3. Include clerks of cities, villages, townships, counties, and Regional Planning Commissions (RPC) affected.

The referenced mailing list was submitted to the PSCW under separate cover.

4. Include all state and federal agencies with whom you are working, and local media that you have informed about the project (at least one print and one broadcast).

Agency List

Mr. Timothy W. Peterson
Regulatory Project Manager
US Army Corps of Engineers
1568 Highway 2
Two Harbors, MN 55616

Mr. James Weinzierl
US Army Corps of Engineers
1568 Highway 2
Two Harbors, MN 55616

Mr. Chip Brown
Wisconsin Historical Society
816 State St.
Madison, WI 54706

Mr. David Farrar
Bureau of Indian Affairs
615 W Main St.
Ashland, WI 54806

Mr. Peter Nauth
Wisconsin Dept of Agriculture
PO Box 8911
Madison, WI 53708-8911

Ms. Janet Smith
US Fish & Wildlife
1015 Challenger Ct
Green Bay, WI 54311

Mr. Gary Dikkers
WDOT
Bureau of Aeronautics
PO Box 7914
Madison, WI 53707-7914

Mr. Alfred Trepania
Lac Courte Oreilles
Route 2, Box 2700
Hayward, WI 54843

Mr. David Siebert
Wisconsin DNR
PO Box 7921
Madison, WI 53707-7921

Mr. Robert Fasick
WDOT
Bureau of Highway Operations
PO Box 7986
Room 501
Madison, WI 53707-7986

Ms. Jill Medland
National Park Service
PO Box 708
St Croix Falls, WI 54024-0708

Mr. Tim Hanley
WDOT District 4
PO Box 8021
Wisconsin Rapids, WI 54495-8021

Mr. Thomas Gilbert
National Park Service
700 Rayovac Dr
Suite 100
Madison, WI 53711

Mr. John Krebsbach
WDOT District 7
Hanson Lake Road
PO Box 777
Rhineland, WI 54501

Mr. Tim Pawelski
WI DOT District 6
718 W Clairemont Ave
Eau Claire, WI 54701-5108

Local Media Contacts

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Cadott, WI 54727
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Fax: 715-239-6200

Cumberland Advocate
Sharon Bucher
1375 2nd Ave
PO Box 637
Cumberland, WI 54829
Phone: 715-822-4469
Fax: 715-822-4451

Ladysmith News
John Terill
120 W. 3rd Street S
PO Box 189
Ladysmith, WI 54848-0189
Phone: 715-532-5591
Fax: None

The Bee (Phillips/Price)
Ray Rivard
115 N. Lake Ave
PO Box 170
Phillips, WI 54555
Phone: 715-339-3036
Fax: 715-339-4300

O-W Enterprise
Larry Shimono
1006 Division Street
PO Box F
Withee, WI 54498
Phone: 715-229-2103
Fax: 715-229-2104

Cornell & Lake Holcombe Courier
Heather Hill
121 Main Street
PO Box 546
Cornell, WI 54732-0546
Phone: 715-239-6688
Fax: 715-239-6200

Country Today – Eau Claire
Jim Massey
611 S. Farwell
PO Box 570
Eau Claire, WI 54702
Phone: 715-833-9270
Fax: 715-833-9273

Park Falls Herald
Kenneth Dischler
259 2nd Ave. N
PO Box 410
Park Falls, WI 54552
Phone: 715-762-4940
Fax: 715-762-2757

The Stanley Republican
BJ Fazendin
PO Box 185
Stanley, WI 54768-0185
Phone: 715-644-3319
Fax: 715-644-5452

Sawyer County Gazette
Meredith Rickert
Main Street
PO Box 68
Winter, WI 54896
Phone: 715-266-2511
Fax: Same

Thorp Courier
Mark La Gasse
403 N. Washington
Thorp, WI 54771
Phone: 715-669-5525
Fax: 715-669-5596

Washburn County Register
Marc Parenteau
PO Box 637
Washburn, WI 54891
Phone: 715-468-2314
Fax: Same

Barron County News-Shield
Robert Groshong
219 E. LaSalle Ave
PO Box 100
Barron, WI 54812
Phone: 715-537-3117
Fax: 715-537-5640

The Star News – Medford
Don Woerpel
116 S. Wisconsin Ave
PO Box 180
Medford, WI 54451
Phone: 715-748-2626
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B. Provide information concerning contacts with affected landowners.

1. Copy of letters sent to property owners

See Figure A33.

2. Date of public informational meeting

See Figure A34 which contains news releases for public meetings.

See Figure A35 for a copy of the notice for the public meetings and a list of newspapers to which it was sent.

3. Comment sheet distributed

See Figure A36 which contains copies of public information meeting handouts, the comment sheet, and comment sheet summaries.

VIII. Methodology

Please see Figure A37-1 to A37-5 for methodology used to gather information for this worksheet.